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Q FEVER

SEROLOGICAL EVIDENCE OF THE OCCURRENCE OF A CASE IN SOUTH AFRICA

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Q fever is a rickettsial disease caused by *Rickettsia burneti* or *Coxiella burneti*. This organism was first shown by Burnet and Freeman[1] to be the cause of Q fever, a disease first described by Derrick[2] in 1937, affecting abattoir workers in Australia. The illness was characterized by fever, headache and malaise. The infection was traced to ticks of which the species *Haemaphysalis humerosa*, collected from bandicoots, was found to be naturally infected on several occasions. This tick also infests rats and occasionally cattle. Several other species of tick were shown to be capable of harbouring the rickettsiae and transmitting the infection to experimental animals.

A rickettsia first named *R. diaporica* was isolated from naturally infected ticks by Davis and Cox[3] in Montana, U.S.A. Because the ticks from which the causative rickettsia was isolated were collected near Nine Mile, Montana, this new disease was named nine-mile fever.

Several laboratory workers studying this organism contracted an infection characterized by fever and headache associated with pneumonitis. It was noted by Dyer[4] that the symptoms and signs of nine-mile fever in man and of Q fever were similar. The identity of *R. diaporica* and *R. burneti* was then proved by the studies of Dyer[5] and Bengtson[6] in the United States, and of Burnet and Freeman[7] in Australia. The disease Q fever was thus known to occur naturally in Queensland, Australia, and in Montana, United States of America.

During and immediately subsequent to the recent war, it became apparent that Q fever is an important and widespread disease causing a condition resembling atypical virus pneumonia.

In 1944 and 1945 outbreaks of Q fever occurred in troops billeted in rural areas in Northern and Southern Italy (Robbins, Gauld and Warner[8]). Previous to this, in 1944 Caminopetros[9] recovered an infectious agent later identified as *R. burneti* from a case of 'Balkan Grippe'. This, as its name suggests, was an influenza-like illness, affecting particularly the German troops occupying Greece, while the local population remained comparatively free. In North Africa Blanc, Martin and Maurice[10] have reported the recovery of *R. burneti* from ticks. It thus became apparent that Q fever was a widespread and important disease in the countries bordering the Mediterranean.

Since then the disease has been discovered and shown to be widespread in other countries of Europe. Recently the first cases proved by the isolation of *R. burneti* were reported from Great Britain.[11]

In the United States intensive studies have revealed that the disease is not limited to Montana where the causative organism *R. burneti* was first isolated, but indeed has been discovered in every State of the United States. The infection is nearly always traced to association with cows or cattle.[12] It is presumed that in most cases it is acquired by the inhalation of dust from cow hides contaminated with the excreta of infected ticks. It has been shown that the excreta of infected ticks contain enormous numbers of rickettsiae, which are extraordinarily resistant and apparently survive in the dried state for many years. Several cases have also been described in which the infection was contracted from drinking infected milk. In California a large proportion of bulk milk samples have been found to be infected with *R. burneti*. In Greece there is evidence that the milk of infected sheep and goats is also infected and may be responsible for human infections.[9] Another infection is thus added to the already formidable list of milk-borne diseases.

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CLINICAL PICTURE

The incubation period varies from 14 to 30 days with a mean of 19 days. The onset is usually sudden, occasionally insidious with general malaise, chilly sensations, and headache, and sometimes nausea and vomiting.

The fever lasts from one to 14 days, occasionally longer, but usually from three to six days. The temperature curve is remittent or swinging in type. During this time the patient complains of severe and persistent headache, and often of nuchal pain. Insomnia may be troublesome. In severe cases the patient becomes drowsy or stuporous. Most complain of photophobia and pains in the eyes on movement. The pulse rate is often slow in relation to the fever. Anorexia is marked and is occasionally associated with nausea and vomiting. More than half the patients develop a cough on the fourth to the sixth day. This is non-productive or productive of a small amount of thick tenacious white, occasionally blood-stained, sputum. Most of these patients experience thoracic pain either substernally or on the side of a demonstrated lesion in the lung. The pain is usually not sufficiently severe to cause difficulty in breathing.

Physical examination at this time usually reveals little abnormal in the chest, though crepitant râles may be detected. However, X-ray evidence of lung involvement is seen in nearly all patients. The X-ray changes closely resemble and may be indistinguishable from those of primary atypical pneumonia. The lesions are patchy and of soft diffuse type of infiltration and usually involve only one lobe of a lung. There is apparently little correlation between the severity of the patient's illness and the extent of lung involvement.

In most cases the red and white cell counts are within the normal range. In the differential count the percentage of neutrophil leucocytes is usually increased to over 70%.

Unlike the typhus group of fevers, there is no characteristic rash and the Weil-Felix test gives negative results. No agglutinins for *B. typhosus* or for the Brucella group of organisms develop. The diagnosis can be confirmed by serological tests. The most helpful of these is the complement fixation test with a specific antigen prepared from egg cultures of *Rickettsia burneti*. The test usually does not become positive until after the seventh day of illness. The maximum titre is attained about the twenty-first day after the onset. Titres of 1 : 20 and over are of diagnostic value, but it is preferable to compare the serum collected early in the illness with a specimen collected late or in convalescence to demonstrate the appearance of antibodies or an increase in titre in the second specimen.

Complications are infrequent and death rarely occurs. Post-mortem examination of one of these fatal cases revealed congestion and oedema of the lungs associated with gray consolidation of one lobe, and acute enlargement and congestion of the spleen. On histological examination sections of the lung showed fibrinous exudate in the alveoli containing lymphocytes, plasma cells, and large mononuclear cells. There were few neutrophil leucocytes in the exudate. The interalveolar septa was swollen with accumulation of lymphocytes, plasma cells, and large mononuclear cells. The bronchial epithelium was generally desquamated.

CASE REPORT

This paper records a case in which the diagnosis of Q fever was suggested by the clinical symptoms and confirmed by serological tests. The causative organism was not isolated.

The patient was a European boy 2½ years old. He was born and has always remained in the Western Transvaal. He was first seen on the farm where he stayed on 6 July 1949, having taken ill the previous day with high fever, coughing, and some vomiting.

On examination his temperature was 102° F., and pulse rate 130 per minute. There was diminished air entry at the base of the right lung and scattered crepitations in both lung fields. He was provisionally diagnosed as an early pneumonia case and given penicillin and sulphadiazine. On 8 July he was seen again, when his temperature was again found to be 102° F. and pulse rate 130 per minute. He now complained of flitting pains in the limbs, but there was no tenderness on pressure over the muscles or joints. In addition to penicillin he was now given streptomycin, which he received for two days.

Fever with an irregularly intermittent temperature persisted for another four days when it returned to normal. He was considered to have been a case of atypical pneumonia.

He was seen again on 6 October, three months after the first pyrexial attack. His mother stated that he had had fever on a number of occasions during the intervening three months. His temperature now was 101.5° F. and his pulse 135 per minute. The cervical glands were enlarged. There was no rash, no signs of an insect bite and no enlargement of liver or spleen. The possibility of glandular fever, relapsing fever, malta fever, and tick-bite fever were considered and a specimen of blood taken for serological diagnostic tests. Aureomycin, 250 mg., was administered twice daily for four days and the patient rapidly improved.

The patient's serum gave a negative Widal and Weil-Felix test. The rickettsial complement fixation tests gave the following results:

Antigen	*Serum Dilution*							
	1:6.25	1:12.5	1:25	1:50	1:100	1:200	1:400	1:800
R. prowazeki epidemic typhus	—	—	—	—	—	—	—	—
R. mooseri murine typhus	—	—	—	—	—	—	—	—
R. rickettsi tick-bite fever	—	—	—	—	—	—	—	—
R. burneti Q fever	+	+	+	±	—	—	—	—
Borrelia duttoni relapsing fever	—	—	—	—	—	—	—	—

This serum thus was found to give a positive result with *R. burneti* in a 'diagnostic' titre, accepting this as 1 : 25. The clinical findings of the patient's illness in July are also compatible with the diagnosis of Q fever, which is frequently diagnosed as atypical pneumonia. Indeed until its true nature was recognized several outbreaks of Q fever were diagnosed and described as outbreaks of atypical virus pneumonia.

Relapsing forms of Q fever have not yet been described, but it seems possible that the several febrile attacks may have been recrudescences of the infection. On the other hand these of course may have not been related to the first illness at all.

Although this serological finding is strong evidence of Q fever, this condition cannot be diagnosed with absolute certainty until the causative organism *R. burneti* has been isolated and identified. No attempt was made to do this in this case owing to the time which had elapsed between the patient's attack of atypical pneumonia and the time when the diagnosis of Q fever was made from the serological tests. The main purpose of this paper is to draw attention to this serological evidence of the occurrence of Q fever in South Africa, so that this diagnosis will be borne in mind in other similar cases.

If and when the causative organism has been isolated, South Africa will be added to the long list of countries in which Q fever has been identified since the recent war, before which it seemed to be a condition of academic interest only except in Queensland, Australia.

The confirmation of a diagnosis of Q fever has a practical value for like other rickettsial diseases, it responds specifically to treatment with aureomycin and chloromycetin.

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THE LABORATORY DIAGNOSIS OF TUBERCULOUS MENINGITIS

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Until comparatively recently tuberculous meningitis was a uniformly fatal disease, hence the early diagnosis of this condition was mainly of academic interest. Since the discovery of streptomycin, however, the earliest confirmation of this infection has become most important because it is reasonable to assume that the response to specific therapy will depend upon the stage of the disease in which treatment is instituted. The earlier the patient is treated the greater the possibilities are that the progress of the disease will be arrested and cure may occur.

The present investigation covers a series of 104 cases of tuberculous meningitis which were diagnosed both by clinical and by laboratory methods. The criterion adopted in the selection of these cases was the finding, microscopically, of acid-fast bacilli in the cerebrospinal fluid. It is well-known that acid-fast bacilli appear intermittently rather than regularly in the cerebrospinal fluid of a patient suffering from tuberculous meningitis, and, because of the necessity for early diagnosis of the condition, it was therefore decided to undertake prolonged and meticulous direct examination of the cerebrospinal fluid for the presence of these acid-fast bacilli. The preparations were made by spinning the spinal fluid at 3,000 r.p.m. for one hour and making a preparation from the whole of the deposit. This was stained in the usual manner and examined field by field microscopically until the whole preparation had been covered. On occasion a preparation would be examined in this way by each of us before being discarded.

Neither cytological nor chemical findings were regarded as being 'positively' or 'negatively' indicative and, as will be shown, these findings might have been misleading.

LITERATURE

Merritt and Freemont-Smith (1937) give the following chemical and cytological findings of the cerebrospinal fluid in cases of tuberculous meningitis:

Cell count: 5 to 2021 per c.mm.

Protein: 25 to 100 mg. per 100 c.c. in 28% of cases and 100 to 1142 mg. per 100 c.c. in 72% of cases.

Sugar: The sugar content varied from 5 mg. per 100 c.c. or less, to 59 mg. per 100 c.c. Normal or low values may occur early in the disease.

Chloride: The chloride range varied from 471 to 753 mg. per 100 c.c. with an 'average' of 608 mg. per 100 c.c.

They give as typical the following findings of the cerebrospinal fluid in tuberculous meningitis.

1. The pressure is increased.
2. The fluid is clear or ground glass in appearance, colourless or faintly xanthochromic with formation of a delicate web-like coagulum.
3. The cell count *usually* ranges from 25 to 500 per c.mm. with lymphocytes predominating.
4. The protein content is increased.
5. The sugar content is decreased.
6. The chloride content is decreased.

They state that none of the above findings is alone pathognomonic of tuberculous meningitis but, when found together, they form a syndrome which very rarely occurs in any other condition.

Harrison (1937) gives the following average chemical and cytological figures in cases of tuberculous meningitis:

Total protein: 30 to 400 mg. per 100 c.c.

Chloride: 700 to 500 mg. per 100 c.c.

Sugar: In the early stages the sugar content may be normal or increased: later the range varies from 15 to 45 mg. per 100 c.c.

Cell count: This ranges from 20 to 1,000 or more per c.mm. with a usual range of 100 to 300 per c.mm.

Harington (1939), in a review of 69 cases of tuberculous meningitis, made the following observations:

Cell count: 56.4 per cent. of cases showed a severe (150 to 250 cells per c.mm.) pleocytosis while the numbers showing a moderate (10 to 50 cells per c.mm.) and extreme (over 250 cells per c.mm.) pleocytosis were equal (21.8%.). In all except three cases, in which polymorphonuclear cells predominated, lymphocytes and mononuclear cells were predominant.

Sugar content: In 51.5% of 68 cases the sugar content was below 20 mg. per 100 c.c., but the author states that these low figures are probably largely accounted for by glycolysis due to the lapse of time between the collection of the specimen and the performance of the test.

Globulin: A 'positive' Pandy's test was obtained in all fluids examined. The excess varied from a slight to a marked increase.

Chloride content: In every instance (69 cases), the value obtained was below normal. The lowest reading was 515 mg. per 100 c.c. and the highest 685 mg. per 100 c.c.; 59.4% of cases gave values below 600 mg. per 100 c.c. and in only 4.3% of cases were values greater than 650 mg. per 100 c.c. obtained.

This author states that the association of a slight or moderate decrease of glucose with a noteworthy decrease of chlorides and a positive test for globulin in a fluid not showing the characteristics of a suppurative meningitis is very strong presumptive evidence that the fluid will be found to contain tubercle bacilli.

Topley and Wilson (1946) state: 'The laboratory diagnosis is often difficult . . . lumbar puncture reveals a fluid which may be limpid and may contain only mononuclear cells. The protein content is, however, always raised while both the sugar and chloride contents are much decreased. The number of cells is generally increased, the most usual count being between 50 and 400 per c.mm. In most cases these cells consist chiefly of lymphocytes but these are almost always associated with numerous polymorphonuclear and often with some plasma cells.'

Gairdner (1947) found that in 52 cases of tuberculous meningitis (first specimen of cerebrospinal fluid examined) 11 cases had a chloride content of 700 mg. per 100 c.c. and over, 23 cases a chloride content of 650 to 690 mg. per 100 c.c. and that in 18 cases only (approximately 33%) was the chloride level between 600 and 640 mg. per 100 c.c. He states that the finding of a normal chloride content in the cerebrospinal fluid should in no way argue against a diagnosis of tuberculous meningitis.

Lincoln (1947) obtained the following figures in the investigation of 125 cases of tuberculous meningitis. In 86.4% of cases the cell count was less than, and in 13.6% greater than 350 cells per c.mm. The sugar content was less than 38 mg. per 100 c.c. in 96.4% of cases. The protein content was greater than 50 mg. per 100 c.c. in 55.7% of cases and the chloride content was less than 680 mg. per 100 c.c. in 86.7% of cases. She stated that a low or falling sugar content is the most valuable diagnostic feature of the cerebrospinal fluid in tuberculous meningitis, excluding the finding of tubercle bacilli. Nevertheless, she encountered four cases with a sugar content of over 55 mg. per 100 c.c. within a week of death, one infant with a protein content of 24 mg. per 100 c.c. five days before death, and one child with a cell count of 5 per c.mm. two days before death.

Finlayson (1948) states that while certain changes are frequently found in tuberculous meningitis, as for example, a low chloride content, no single abnormal constituent except the presence of tubercle bacilli is diagnostic of tuberculous meningitis.

Rubie and Mohun (1949) state, *inter alia*, 'we had hoped to be able to discover at least one diagnostically helpful feature in the cerebrospinal fluid. It is now clear, however, that such a hope did not take into account the urgent necessity for earlier diagnosis'. When the disease had reached the stages indicated in their case reviews the most useful findings in the cerebrospinal fluid were the low chloride, the raised protein content and the increased lymphocytic cell count in that order of importance.

Normal Standards Adopted by the South African Institute for Medical Research. The standards of normal cerebrospinal fluid adopted by the South African Institute for Medical Research are: cell count, 0-5 per c.mm.; protein, 15-45 mg. per 100 c.c.; sugar, 50-80 mg. per 100 c.c. and chloride, 700-750 mg. per 100 c.c.

THE CHEMICAL FINDINGS IN THE PRESENT SERIES

The chloride contents of the fluids were not found to be in accordance with the generally accepted criteria

in tuberculous meningitis. Findings of chloride contents higher than 650 mg. per 100 c.c. have come to be regarded by some as against a diagnosis of the disease.

Of 135 specimens of cerebrospinal fluid, showing the presence of acid-fast bacilli, from the 104 cases under review in the present investigation, 55 (approximately 40.8%) showed a chloride content of more than 650 mg. per 100 c.c. and of these, four showed a finding of more than 750 mg. per 100 c.c. Three of these latter were known to be from cases in the course of treatment with streptomycin.

In comparison with the findings in cases of tuberculous meningitis are the chloride contents of 100 cases of meningitis, due to causes other than the tubercle bacillus, occurring during the period covered by this investigation. Of these 55 (55%) showed a chloride content of more than 650 mg. per 100 c.c. and one case gave a finding of more than 750 per 100 c.c. Table I gives a more detailed comparison between the two series.

TABLE I

Chloride Content.	*Tuberculous Meningitis.*		*Non-Tuberculous Meningitis.*	
	No. of Specimens.	*Percentage.*	*No. of Specimens.*	*Percentage.*
400—450	1	(0·74)	0	0
450—500	2	(1·48)	0	0
500—550	12	(8·88)	0	0
550—600	25	18·5	6	6
600—650	40	29·6	39	39
650—700	38	28·2	46	46
700—750	13	(9·62)	8	8
more than 750	4	(2.96)	1	1
Total ..	135	(99.98)	100	100

It will be realized therefore that the chloride contents in many cases are not necessarily of diagnostic significance in cases of tuberculous meningitis and that a high finding does not necessarily preclude such a diagnosis.

The sugar contents showed similar departures from the generally expected findings in tuberculous meningitis. Of 134 specimens of cerebrospinal fluid, in which acid-fast bacilli were detected, from the 104 cases under consideration, 38 (approximately 28.3%) showed a sugar content of more than 45 mg. per 100 c.c.

The chloride and sugar contents of the cerebrospinal fluids from 10 cases in which those were estimated fairly regularly over lengthy periods are given in Tables II and III. Of the 10 cases considered, six had a commencing chloride content of over 650 mg. per 100 c.c. and of these, two showed a finding of 705 mg. per 100 c.c. Five of the cases showed an initial sugar content of more than 45 mg. per 100 c.c., one giving a result of 73 mg. per 100 c.c.

Table II gives the results of the chloride contents in a total of 174 specimens and Table III the sugar contents of 172 specimens of cerebrospinal fluid. Discrepancies between the total numbers of chloride and sugar estimations are due to some of the specimens being insufficient in quantity for complete analysis.

The results confirm the findings in individual cases that the chloride and sugar contents in a large proportion of specimens are higher than those generally regarded as occurring in tuberculous meningitis. Some of the results are those expected in normal cerebrospinal fluids.

TABLE III

Case Number.	*No. of Specimens Showing a Sugar Content of (mg. per 100 cc.)*		*Highest Sugar Content.*	*Total No. of Sugar Estimations.*
	<45	>45		
1	8	7	63	15
2	13	5	58	18
3	1	21	65	22
4	7	6	73	13
5	6	3	58	9
6	24	1	48	25
7	9	8	73	17
8	7	3	53	10
9	35	1	47	36
10	5	2	55	7

UNUSUAL FINDINGS

Although in the present series the spinal fluid in the majority of cases showed the generally accepted finding of a greater or less increase of lymphocytes this did not always obtain.

In one case, the cerebrospinal fluid when received gave a cell count of one polymorphonuclear and one lymphocyte per c.mm., a protein content of 30 mg.

TABLE II

Case No.	*Period Covered by Investigations*	*No. of Specimens Showing a Chloride Content of (mg. per 100 c.c.):* 0-550	550-650	650-750	>750	*Highest Chloride Content*	*Total No. of Chloride Estimations*
1	5 months	0	5	8	2	810	15
2	6 months	1	12	5	0	715	18
3	3 months	0	0	22	0	735	22
4	6 months	0	3	11	0	735	14
5	2 months	0	4	5	0	670	9
6	3 months	0	19	6	0	675	25
7	7 months	0	2	15	0	720	17
8	3 months	0	3	6	1	775	10
9	9 months	0	29	7	1	760	37
10	4 months	0	4	3	0	725	7

per 100 c.c. and a chloride content of 675 mg. per 100 c.c. The sugar was not estimated. This case proved at post mortem examination to be one of miliary tuberculosis with a single tuberculoma on the meninges.

In four cases, the first specimen of fluid to show the presence of acid-fast bacilli was purulent in character. One of these gave a chloride content of 670 mg. per 100 c.c., two were below 650 mg. per 100 c.c., and one was not estimated. The sugar content of each was below 45 mg. per 100 c.c. One case died one hour after admission to hospital.

The third specimen from one patient in which acid-fast bacilli were observed was purulent in character. This specimen was obtained about three weeks after the first and the two previous ones had shown a preponderance of lymphocytes. Later specimens also showed an excess of lymphocytes.

Two other spinal fluids gave unusual results.

One was submitted for biological test approximately five months after the commencement of the disease and initiation of treatment with streptomycin.

The findings were as follows:

Cells: 11 lymphocytes per c.mm.
Protein: 40 mg. per 100 c.c.
Chloride: 725 mg. per 100 c.c.
Sugar: 43 mg. per 100 c.c.

The biological test for the tubercle bacillus proved to be positive.

The other was from a patient in a tuberculosis sanatorium. The condition was immediately diagnosed and many successive specimens of cerebrospinal fluid were submitted for examination.

The first specimen gave the following findings:

Cells: 2 lymphocytes per c.mm.
Protein: No excess globulin.
Chloride: 685 mg. per 100 c.c.
Sugar: 50 mg. per 100 c.c.
Acid-fast bacilli were not detected.

Acid-fast bacilli were only detected two weeks later and in this specimen the findings were:

Cells: 189 polymorphonuclears, 57 lymphocytes per c.mm.
Protein: 40 mg. per 100 c.c. (centrifugalized specimen).
Chloride: 725 mg. per 100 c.c.
Sugar: 40 mg. per 100 c.c.

None of the specimens received showed a chloride content of less than 650 mg. per 100 c.c. The chloride results of 22 specimens ranged from 670 to 725 mg. per 100 c.c. Only one specimen gave a sugar result of less than 45 mg. per 100 c.c. The cerebrospinal fluid reverted to normal after three weeks.

DISCUSSION

It appears that the chloride contents of the fluids in tuberculous meningitis are not as significant as may have formerly been believed. High chloride contents have been obtained in various specimens at all stages of the disease and these findings cannot be regarded as precluding the diagnosis of tuberculous meningitis. A considerable proportion of the cases encountered also showed what would be regarded as a normal sugar content in the cerebrospinal fluid.

Ten cases have been considered in detail embracing 174 specimens in which analysis of the chloride contents are available and 172 in which the sugar contents are given.

The analyses available confirm the view that chemical findings are not necessarily of diagnostic significance in tuberculous meningitis. A number of specimens showed the chemical findings of normal cerebrospinal fluids.

That the cytological findings may also vary considerably was shown in six cases. Five of these gave a frankly purulent cerebrospinal fluid at some time during the course of the disease. The other one showed only two cells per c.mm. and proved to be a case of miliary tuberculosis with a single tuberculoma on the meninges.

The persistence of acid-fast bacilli in the cerebrospinal fluid in a case treated with streptomycin is shown by the obtaining of a positive biological result from a specimen taken five months after the commencement of the disease. This is probably due to the continued presence of the tubercle bacilli in the fibrinous, relatively avascular, adhesions at the base of the brain into which the streptomycin may not penetrate.

It seems possible that the use of streptomycin may play a considerable part in the alteration of the chemical and cytological findings as it has in altering the course of the disease. In the cases under review the chemical and cytological findings showed considerable variation from those of previous authors.

The most satisfactory method of diagnosis would appear to be that of clinical diagnosis coupled with the intensive search for the causal micro-organism, with cytological and chemical results used as an adjunct during the course of treatment.

SUMMARY

The chemical and cytological findings of 104 cases of tuberculous meningitis, in which acid-fast bacilli were observed in the cerebrospinal fluid are considered.

Neither cytological nor chemical findings nor a combination of these can be regarded as providing definite evidence pathognomonic of the disease, as many variations are encountered.

The search for acid-fast bacilli should be intensive in order to aid diagnosis and these may be found in an otherwise almost normal cerebrospinal fluid during the course of the disease when treated with streptomycin.

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VAN DIE REDAKSIE

RADIO-AKTIEWE PADDAS

Suid-Afrikaners sal belangstel in die proefnemings wat aan die Universiteit van Chicago in die Verenigde State gedoen word onder leiding van dr. E. M. Geiling wat voorheen 'n Suid-Afrikaner was.

Sestig tropiese paddas word met radio-aktiewe kos gevoer as 'n deel van die navorsingsprogram in verband met kongestiewe hartverlamming.

Die paddas skei 'n giftige melkagtige stof af wat bufagien genoem word en waarvan 'n geneesmiddel gemaak word wat bekendstaan as bufotoksien. Die uitwerking van hierdie geneesmiddel by die stimulering van 'n hart wat wil ingee is soortgelyk aan dié van digitalis.

Daar word gehoop om 'n radio-aktiewe vorm van bufotoksien te produseer deur paddas met radio-aktiewe kos te voer. Wanneer hierdie geneesmiddel in 'n proefdier ingespuit word wat aan hartverlamming soos dié van 'n mens ly, sal dit moontlik wees om die roete van die geneesmiddel deur die dier se liggaam te volg en miskien om te sien hoe en waarom dit die hart stimuleer.

Deur die paddas as 'n „fabriek" vir die produksie van radio-aktiewe bufotoksien te gebruik, mag die ondersoekers uitvind hoe om die geneesmiddel sinteties te vervaardig en miskien om 'n geneesmiddel te vind wat hartverlamming sal verhoed sowel as verlig.

Die dieët van die paddas sluit slakke, alge en kakkerlakke in wat radio-aktief gemaak word deur die „gemerkte" atome in plante waarvan hulle leef. Die plante kry hulle radio-aktiwiteit van 'n spesiale soort atmosfeer waarin hulle gekweek word—'n atmosfeer van koolsuurgas wat gemaak word deur gewone suurstof te laat verbind met koolstof wat in die atoomoonde van die Atoomkragkommissie van die Verenigde State bestraal is.

Hierdie proefnemings van die Universiteit van Chicago maak deel uit van 'n wye navorsingsprogram wat nou in die Verenigde State in verband met die gebruik van radio-aktiewe isotope in geneeskunde uitgevoer word.

EDITORIAL

RADIO-ACTIVE TOADS

South Africans will be interested in the experiments being conducted at the University of Chicago in the United States under the direction of Dr. E. M. Geiling, a former South African.

Sixty tropical toads are being fed on a radioactive diet as part of a programme of research on congestive heart failure.

The toads produce a poisonous, milky-white substance called bufagin, from which a drug known as bufotoxin is made. The effect of this drug in stimulating a failing heart is similar to that of digitalis.

By feeding a radioactive diet to the toads, it is hoped to produce a radioactive form of bufotoxin. When this drug is injected into a laboratory animal suffering from heart failure similar to that of a human being, it will be possible to follow the course of the drug through the animal's body, and perhaps see how and why the drug stimulates the heart.

By using the toads as a 'factory' for producing radioactive bufotoxin, the investigators may learn how to synthesize the drug, and perhaps to find one that will prevent as well as relieve heart failure.

The diet of the toads includes snails, algae and cockroaches whose bodies are made radioactive by the 'tagged' atoms in plants upon which they feed. The plants received their radioactivity from a special kind of atmosphere in which they were grown—an atmosphere of carbon dioxide made by uniting ordinary oxygen with carbon that has been irradiated in the atomic furnaces of the United States Atomic Energy Commission.

These experiments of the University of Chicago are part of a broad research programme now being conducted in the United States on the use of radio-isotopes in medicine.

LEIOMYOMATA OF THE STOMACH

FRANK GREENWOOD, L.R.C.P., M.R.C.S., D.M.R.E.
and
ERIC SAMUEL, M.D., F.R.C.S., F.F.R., D.M.R.E.
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Benign tumours of the stomach are uncommon but of this group from 36% to 60% of those reported are leiomyomata.[1, 2] Malignant tumours, on the other hand, occur frequently but only about 1 : 1,000 are leiomyosarcomata.[3] In the 40-year period from 1907 to 1946 only 16 cases of leiomyosarcoma were verified surgically at the Mayo Clinic as compared with 10,000 cases of carcinoma of the stomach, a ratio of 625 : 1.[4] Holta[5] has suggested that as a result of more careful histological examination the number of leiomyosarcomata has increased at the expense of the leiomyomata. Leiomyomata are relatively avascular and prone to degenerative changes and consequently an evaluation of malignant change may be extremely difficult. For this reason the suggested change in the ratio may be less marked than Holta[5] suggests.

Leiomyomata may occur at any age and the sex incidence is about equal. In size they vary from a microscopic lesion to tumours the size of an adult head and they may on occasion be multiple. Anatomically they may be endo- or exo-gastric or, as in two of our cases, both components may be present.

Clinical Features. The symptoms vary with the site of origin of the tumour, the completely exogastric variety giving rise to symptoms only by pressure on the stomach or adjacent organs; on the other hand the endogastric variety may be present either by obstructive symptoms in the stomach or duodenum or more frequently by haemorrhage following ulceration of the overlying gastric mucosa and the tumour itself. With the type that produces obstructive symptoms by blocking the pylorus the influence of posture, frequently noted by the patient, may be very marked. In other cases dramatic haemorrhage or frequently repeated haematemesis may be the presenting symptom, and persistent melaena or occult blood in the stools may be found. Blood is in fact present in the stools in 50% of cases of endogastric leiomyomata.[6] As a result of the prolonged haemorrhage, marked secondary anaemia may develop and this in itself may be the first symptom.

Although leiomyomata are benign, their early recognition is important as they may prove fatal owing either to a single massive haematemesis or repeated smaller haemorrhages.

Radiological Appearances. The radiological features of leiomyomata are:

(*a*) The stomach shows a smooth circumscribed filling defect which is often lobulated. The filling defect may appear as a negative shadow in the barium-filled stomach or as a positive shadow in the gas-filled fundus. The lobulated nature of the mass may be well seen against the gas-filled stomach. The extra-gastric portion of the leiomyoma may be visualized as a soft-tissue opacity outside the stomach. In the three cases described in this article two of the tumours were of the hour-glass type consisting of an exo- and an endogastric mass. The detection of the extragastric component of the leiomyomata is not always possible.

(*b*) In the centre of the mass a deep ulcer crater can generally be seen. This crater has the characters of a peptic ulcer crater.

(*c*) Mucosal relief patterns over the mass show that the mucosal pattern is flattened but the mucosa is not infiltrated.

Other benign tumours of the stomach, e.g. schwanoma or neurinoma may give rise to similar appearances Neurinoma tends to be more lobulated than leiomyoma and between the individual lobules the mucosa may appear normal.

Sarcomatous degeneration in a leiomyoma cannot be detected radiologically. Leiomyomata have to be differentiated from carcinoma of the stomach and the polypoid adenomatous type may cause considerable difficulty in diagnosis. Features which aid the diagnosis are the infiltration and destruction of the mucosa which can be seen by mucosal relief studies.

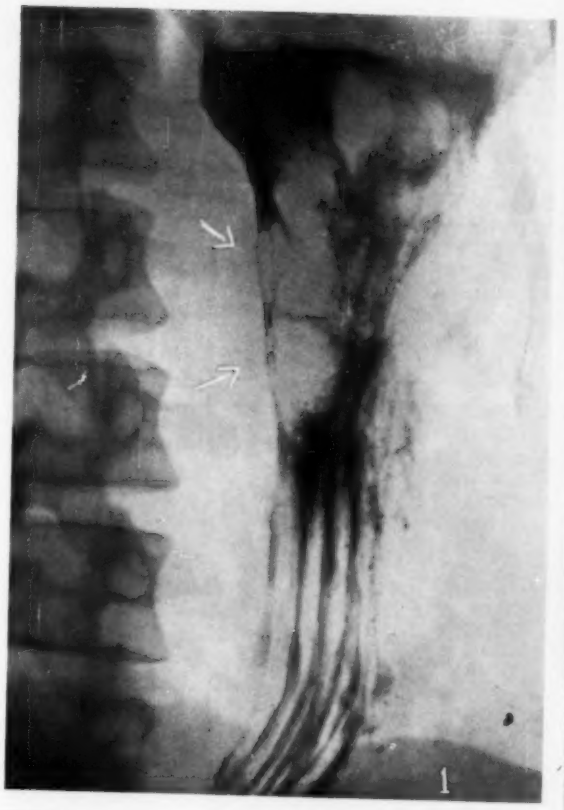
CASE REPORTS

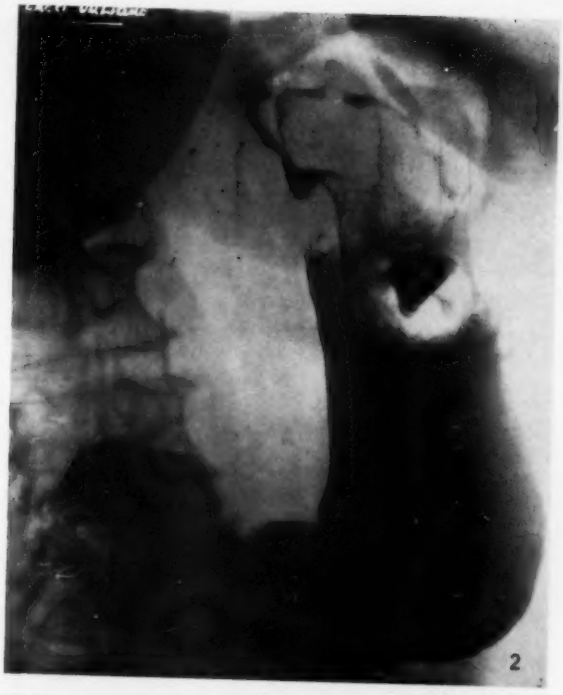
Case 1. A female aged 59 years attended for an X-ray examination complaining of a haematemesis lasting approximately five weeks which occurred 10 weeks before examination. The haematemesis was severe and lasted five weeks and consisted of both bright and dark red blood. The haematemesis was painless except for a slight attack of abdominal cramp immediately before the haematemesis. The patient had noted melaena and constipation for one year before the haematemesis.

Radiological examination (November 1944) demonstrated a large ulcer crater high on the lesser curvature of the stomach. At this time the interpretation of the X-ray appearances suggested a tumour with a centrally placed ulcer.

A further radiological examination carried out elsewhere during 1945-1946 suggested that the repeated haematemesis was from a diverticulum of the stomach with associated gastritis.

On 26 July 1949, nearly five years after her original symptoms, she was again referred for X-ray examination. Now she was frail and markedly anaemic. Melaena had been present for several weeks. Radiological examination revealed a leiomyoma of the posterior wall of the stomach and the diverticulum noted at the previous examination was shown to be a central ulcer crater in the tumour mass. An operation was performed by Mr. Lee McGregor. A lobulated mass arising from the posterior wall of the stomach was





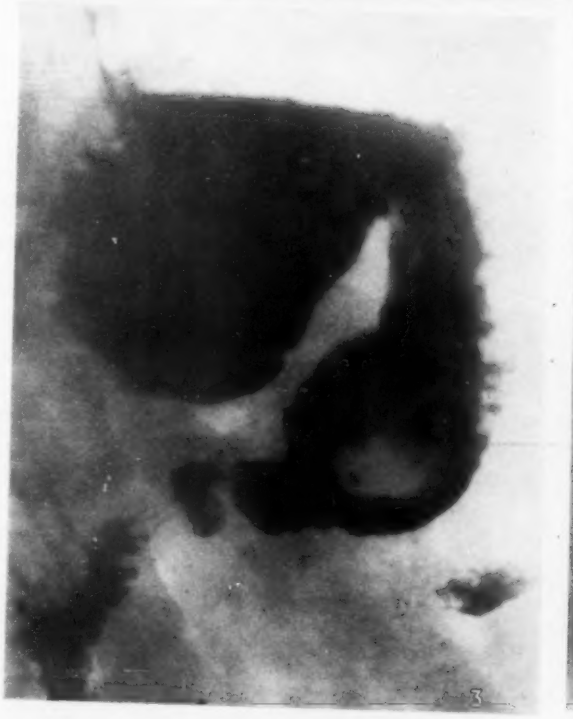


Fig. 1. Case 1. The tumour mass and distorted rugae at the fundus are well shown.
Fig. 2. Case 2. Showing the large ulcer crater in the centre of the tumour mass.
Fig. 3. Case 3. The tumour mass and absence of mucosal folds are demonstrated.
Fig. 4. Case 3. Localized view with compression.

found (Fig. 1). A large extragastric component of the tumour was purplish in colour and densely adherent to the posterior abdominal wall. Removal of the mass demanded the highest technical skill but ultimately the mass was removed, a splenectomy being performed to give access to the mass.

Histological examination revealed a leiomyoma in which sarcomatus changes had occurred.

Case 2. A female aged 51 years complained of repeated haematemesis. The first occurred 10 years and others three years, one year and two weeks before the examination. Each time about one pint of blood was vomited. The patient had no indigestion or loss of weight but at the time of X-ray the blood count showed two million red cells per c.mm.

Radiological examination showed a large tumour mass on the anterior wall of the cardiac end of the stomach (Fig. 2). The mucosa was stretched over the tumour but no invasion of the mucosa had occurred.

Mr. Pocock operated and found a large smooth tumour mass beneath the mucosa on the anterior wall of the cardiac end of the stomach. There was no extragastric mass present nor was the mucosa invaded or ulcerated. The mucosa was incised and the tumour enucleated. The patient made an excellent recovery.

Histological examination revealed a leiomyoma without malignant changes.

Case 3. A male aged 30 years, in December 1942 in East Africa, whilst on military service, developed a sudden acute attack of epigastric pain, colicky in character, accompanied by jaundice and vomiting. The attack was apyrexial, the stools were normal, and X-ray examination of the gall bladder revealed an abnormality which was diagnosed as an amoebic hepatitis. He was treated with emetine and the condition cleared after about three weeks.

In December 1944 a similar attack commenced without warning. This was again diagnosed as biliary colic but X-ray examination of the gall bladder and bacteriological examination of the stools were negative. Sigmoidoscopy also gave negative findings. On treatment with emetine the condition again cleared up.

The patient was well until June 1948 when he first noticed that eating breakfast resulted in continuous heart burn throughout the day. The heart burn was aggravated by foods. The dyspepsia was controlled by omitting breakfast, eating small meals and on occasional cremorin tablet.

In December 1948, at 4 a.m., he vomited about a cupful of altered blood. While being driven to Johannesburg he had a severe haemorrhage and lost consciousness. He was treated on a Meulengracht diet and amphojel for about three weeks before X-ray examination.

Radiological examination showed a simple tumour arising in the middle third of the body of the stomach (Fig. 3). Centrally in the middle of the filling defect there was a persistent fleck of barium present which was suggestive of an ulcer (Fig. 4).

During X-ray examination a feeling of 'periodic contractions' was present in the right hypochondrium. The area over which this was felt corresponded to the site of the tumour mass.

A diagnosis of leiomyoma of the stomach was suggested. An operation was performed by Mr. J. A. Douglas and a wedge-resection of the tumour mass in the middle third of the stomach carried out. Recovery was complete. On section the tumour was found to be a leiomyoma.

SUMMARY

1. Three cases of leiomyomata of the stomach are presented in one of which sarcomatus changes had taken place.

2. The incidence of this type of tumour and the diagnostic features on X-ray examination are discussed.

We have to thank Mr. McGregor, Mr. Pocock and Mr. Douglas for details of the operative findings.

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EXCRETORY UROGRAPHY IN THE YOUNG SUBJECT

HYALURONIDASE AND TOMOGRAPHY AS AIDS

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Radiological investigations on infants and young children are usually difficult, as the subject is afraid and co-operation is lacking. In particular, urography in the young offers two major problems to the radiologist. The first is that an intravenous injection in an infant may be technically a difficult and tedious procedure which upsets the patient and thereby adds to the problem of radiography in an unco-operative subject. The second is that of intestinal gas shadows which are normally sufficient in the infant to obscure any contrast medium in the renal pelvis. A distressed infant collects even more gas in the stomach and small intestine, and in this manner the two problems are linked.

The usual means employed in adults to render the abdomen radiographically clear are not applicable to infants, and the problem is how to visualise the pyelograms in spite of gas rather than how to dispel it. This communication is a preliminary report on an attempt to

overcome these obstacles by the use of tomography following the introduction of the contrast medium intramuscularly with hyaluronidase added.

Urography following the subcutaneous or intramuscular administration of the contrast medium has long been used, probably for the first time by Butzengeiger in 1931,[1] who introduced isotonic solutions of the contrast medium into the axillae. This method necessitates bulky injections, about 500 c.c., and although satisfactory pyelograms may result, they are considerably less dense than those obtained after intravenous injection. The introduction of a new contrast medium by the firm of Bayer (Per-Abrodil), now known by its pharmacopoeial name of diodone, was a step forward in that the drug is far less irritant than the earlier iodoxyl, and can safely be given intramuscularly or subcutaneously without further dilution. However, the objection of low density pyelograms persists even when the drug is given in this way.

In 1929 Duran-Reynals[2] described a 'spreading factor' in tissue extracts which is now recognized as identical with hyaluronidase. The latter is an enzyme which is found in richest concentration in testicular extracts and which has a lytic action on hyaluronic acid, a substance which plays a part in the binding together of cells. The administration of hyaluronidase breaks down the intercellular barrier to rapid absorption of fluids which is created with the help of hyaluronic acid, and permits the more ready entry of fluids into the cellular, lymphatic, and ultimately, the venous circulations.

Hyaluronidase was introduced into clinical medicine in 1947 by Hechter *et al.*,[3] who reported its value in increasing the rate of absorption of fluids administered

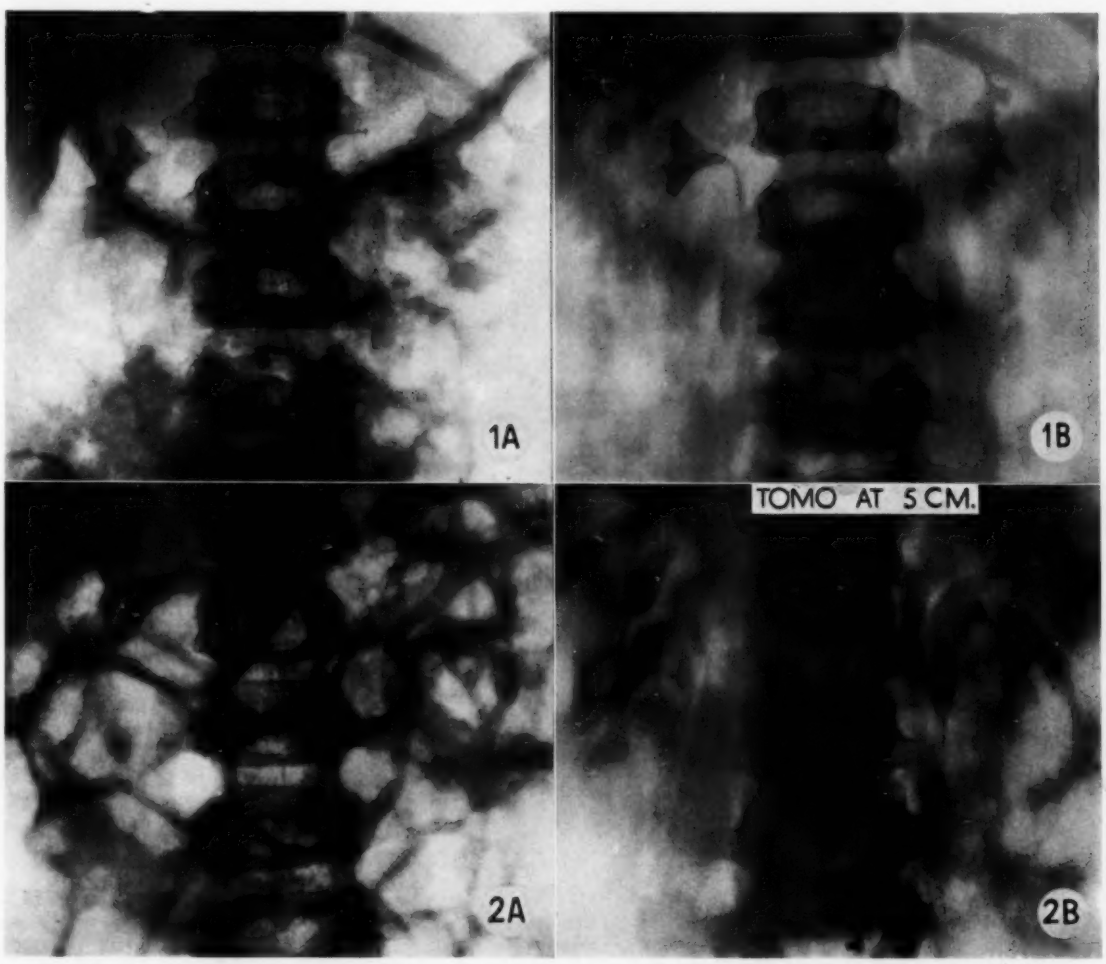

Fig. 1. Normal excretory urograms of a child (aged 22 months) 30 minutes after injection; (*a*) Routine film, showing gas-filled stomach and small bowel overlying pyelograms; (*b*) Tomogram taken immediately afterwards at 5 cm.
Fig. 2. Excretory urograms of child (aged 30 months) 15 minutes after injection; (*a*) Routine film to show obscuring of pyelograms by small intestinal gas shadows; (*b*) Tomogram taken immediately afterwards illustrating a bifid renal pelvis.

by hypodermoclysis. The application of the enzyme in promoting the rapid absorption of a contrast medium depot in the soft tissues will be readily appreciated. A report on the use of hyaluronidase in excretory urography appeared in 1949 by Olsson and Löfgren[4] who reproduce a pyelogram on an adult subject which shows excellent contrast, at least equal to that obtained by the intravenous route.

It is considered that the method to be described here is a simplification of the usual intravenous method and, while not as distressing to the patient, yields much superior information. The enzyme, which is supplied as a dried extract (Alidase—Searle) is dissolved directly in the diodone and the mixture is injected without further dilution, usually in two equal gluteal depots. The single ampoule of hyaluronidase contains 250 viscosity units and this dosage is used for each case. The quantity of diodone has usually been about 50% greater than that recommended for intravenous use but it is doubtful whether this increased dosage is essential. The density of the pyelograms in all normal cases has been found to be similar to that obtained after intravenous urography.

Having obtained satisfactory concentration of the contrast medium in the kidney outflow tract, the second problem—its visualisation through the confusing mass of intestinal gas shadows, remains. It has been found that tomography offers a reasonable answer, and this application of the method has been stressed by Weinbren.[5]

Tomography in infants offers special problems. Normally, a long exposure time of the order of one second is considered essential to allow the X-ray tube to travel through a large enough arc. The infantile respiratory rate is high and an exposure of one second would allow hopeless blurring of the image.

It has been found that if a sedative such as a small dose of barbiturate is given, the child falls asleep during the examination and with quiet respiration an exposure time of 0.2 to 0.3 second can be used. The exposure is made in expiration at the change of respiratory phase. The short time permits the tube to describe an arc of 20 to 25°, and the resulting tomograms will include in focus a rather thicker section than is desirable in tomography of other regions but will be adequate to render insignificant the gas shadows (Figs. 1 and 2). The thicker section is an advantage in that practically the entire thickness of the 'renal plane' can be included and the focus is not highly critical. The distance of the renal plane from the table top is surprisingly constant and, after a few cases, the correct depth can be estimated from the patient's build to within one or two centimetres. In practice, three films are exposed at depths one centimetre apart, the optimum depth is selected, and subsequent films are done at this depth.

To date, no unfavourable reaction has been encountered to either the hyaluronidase or the diodone, but sensitivity is bound to be encountered sooner or later in any large series. An intradermal sensitivity test to hyaluronidase should be done until the nature of any reactions has been adequately investigated over a large series of cases. The usual tests for diodone sensitivity have been performed routinely.

Hyaluronidase is not yet in free supply in South Africa. Its uses in other fields, especially in the subcutaneous administration of fluids, will doubtlessly demand its more ready supply. Excretory urography should then become an important, if subsidiary, indication.

SUMMARY

Excretory urography in the infant and young child is usually rendered difficult and of lessened value because of (*a*) the necessity to administer the drug intravenously, and (*b*) the presence of intestinal gas.

The former difficulty may be overcome by the addition of hyaluronidase to the contrast medium which is then injected intramuscularly. The resulting pyelograms have been found to equal those obtained by the intravenous route.

The second difficulty may be met by tomography, suitably adapted for use on the young subject.

Thanks are due to Drs. S. Javett and S. Heymann for making available the hyaiuronidase used and for permission to publish the pyelograms of their cases.

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PANCREATIC ABSCESS

ITS RADIOLOGICAL FEATURES

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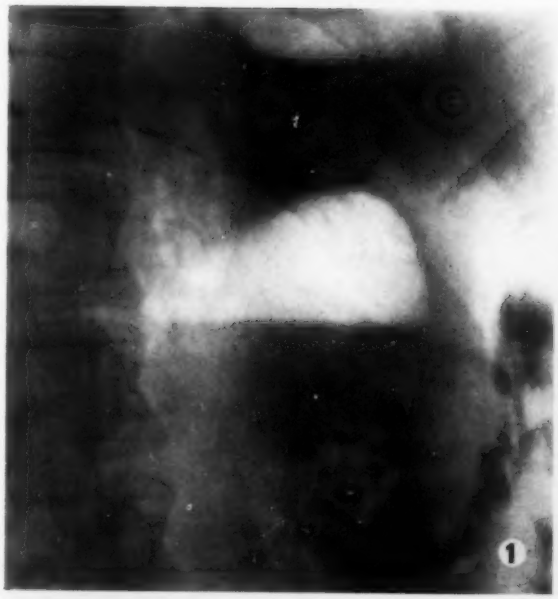
Gas formation in a pancreatic abscess is an excessively rare occurrence. According to Kemp Harper (1949) only three authors (Assmann, 1911; Bittorf, 1913 and Haenish, 1942) have reported a radiological diagnosis of gas formation with a fluid level occurring in an abscess as a sequel to acute pancreatitis. In a textbook of radiology published recently (Buckstein, 1948), however, there is an illustration of a pancreatic abscess showing gas and a fluid level.

Pathology. Pancreatic abscess usually develops as the result of acute pancreatitis, commonly as the acute attack subsides although it may appear after an interval.



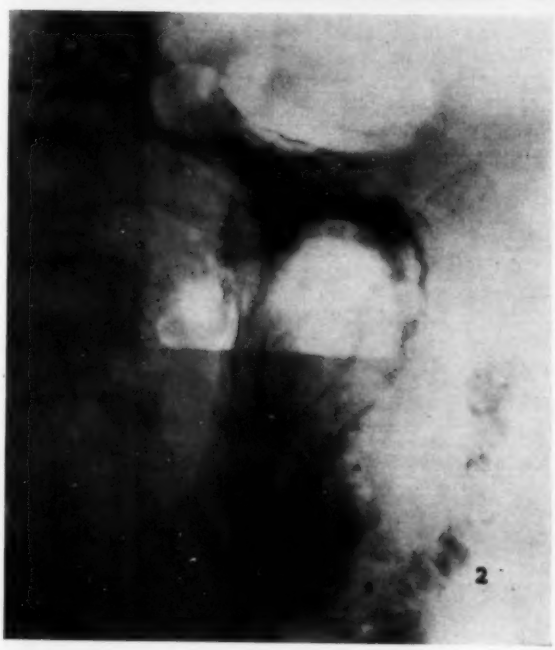


Fig. 1. Film taken in the erect position demonstrating some barium remaining in the splenic flexure of the colon and a large gas filled abscess present in the region of the lesser sac.
Fig. 2. Postero-anterior film showing a fluid level with some barium present in the stomach. The abscess cavity is seen to lie behind the stomach.
Fig. 3. Lateral film of stomach taken in the erect position with a small quantity of barium in the stomach. The stomach can be seen to be displaced forwards by the abscess in the

Gas in the abscess generally results from infection of the necrotic tissue by gas-forming organisms which probably reach the abscess cavity from the adjoining bowel. The presence of gas in the pancreatic abscess is of importance in making the radiological diagnosis, although infection of a pancreatic cyst will give identical appearances. The following case report indicates the radiological features of a pancreatic abscess showing a fluid level.

CASE REPORT

I.F., a male aged 75 years, first presented for medical examination on 9 October 1947, complaining of pain after eating. The pain had commenced six years before and had persisted intermittently since then. A radiological examination of the gastro-intestinal tract in 1947 had failed to reveal any abnormality. Subsequently he had remained well for a further two years, when the pain had re-appeared. At the previous examination he was noted to have diabetes and had lost over 30 lb. in weight since the first onset of his symptoms. There was no history of nausea or vomiting and there was no heart burn. His bowels acted regularly and his appetite was good. At the time of examination some tenderness was present to the right of the umbilicus but otherwise no abdominal signs could be elicitated. The lung fields and cardiac outline were within normal limits. The blood pressure was 150/80 mm. Hg. The clinical diagnosis of diabetes and a duodenal ulcer was made. He was admitted to hospital and the diabetes was

stabilized by dietetic measures alone. No insulin was administered. A radiographic examination of the alimentary canal, as already stated, revealed no abnormality.

He remained well until 9 December 1948, when he developed a swollen right leg. At this time the urine was loaded with sugar and there was considerable oedema of the right leg. The pulsations of the vessels of the right leg were normal. The diagnosis of a deep-seated thrombosis of the right femoral vein was made.

On 9 August 1949, the patient was again examined having complained of diarrhoea for 10 days before with severe epigastric pain of a 24-hour duration not relieved by ½ gr. of morphine. An examination of the heart and lungs revealed no abnormality; the blood pressure was 110/80 mm. Hg. The electrocardiogram was normal. Abdominal examination showed generalized tenderness more marked in both iliac fossae. A rectal examination revealed no abnormality.

He was admitted to hospital two days later, the abdominal pain having persisted. A provisional diagnosis of intestinal obstruction had been made and a barium enema was performed. This was said to show a partial obstruction in the ascending colon. Two days later he was transferred to another hospital for further investigation. At this time his diabetes had been controlled. X-ray examination on 25 October 1949 by barium enema revealed that the colon filled normally, but that there was a large fluid level present in the region of the lesser sac (Fig. I.). Administration of small quantities of barium by mouth revealed an abscess cavity lying in the lesser sac behind the stomach (Figs. 2 and 3). The radiological diagnosis was that of a pancreatic abscess.

Blood investigations at this time showed a blood diastase of 205 units, a blood urea of 85 mg. per 100 c.c. and a negative Ide test. The blood count showed 15 gm. of haemoglobin; colour index, 0.93; red blood cells, 5.100,000 per c.mm.; white cells, 10.300 per c.mm. Granulocytes, 83%; monocytes, 3%; Lymphocytes, 14%.

Four days later exploratory operation was performed (Mr. Lee McGregor) and a large pancreatic abscess was drained. The patient made a good recovery and was discharged from hospital with only a small sinus remaining. There was no digestion of the wound around the sinus. No estimation of the enzyme content of the discharge from the sinus was made.

The Radiological Features. The radiological diagnosis of a pancreatic abscess is dependent on the presence of gas within the abscess cavity. An abscess cavity which shows no fluid level is indistinguishable from a pancreatic cyst, although the clinical picture may indicate the true nature of the mass. If the abscess cavity contains gas, a fluid level lying behind the stomach in the lesser sac can be seen in the erect position. Lateral films demonstrate the stomach displaced forward and stretched around the abscess cavity.

A pancreatic abscess has to be differentiated from other conditions which give rise to a fluid level in the left hypochondrium. The following conditions must be considered:—

1. *A fluid level within a pancreatic cyst.* Infection of a pancreatic cyst may be either the result of operative drainage or the presence of gas-forming organisms spreading from the bowel and contaminating the cyst. Such a cyst is virtually a pancreatic abscess and consequently it gives features identical with a pancreatic abscess both radiologically and clinically.

2. *Fluid levels in large diverticula.* Large diverticula especially around the duodeno-jejunal flexure may give fluid levels in the lesser sac. Diverticula, however, seldom attain the size of pancreatic abscess and in such cases a barium meal will reveal the true nature of the diverticulum.

3. *Obstruction of coils of small bowel from previous inflammatory adhesions.* A single large fluid level in such cases is rare more commonly two or three fluid levels are present. In such cases the markings of the valvulae conniventes in the small bowel enable the correct diagnosis to be made.

4. *An internal hernia into the para-duodenal fossa* equally can be distinguished by the bowel markings.

5. *Splenic abscess.* A large splenic abscess is an excessively rare finding. Its differentiation from a pancreatic abscess may not be possible.

CONCLUSIONS

1. The radiological features of a pancreatic abscess containing gas as a sequel to acute pancreatitis are described.

2. The abscess can only be recognized radiologically when it contains gas and is otherwise indistinguishable from a pancreatic cyst.

I am indebted for permission to publish this case report to Dr. L. I. Braun and Mr. Lee McGregor who were responsible for the care and treatment of the patient.

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ABSTRACT

Trachonychia (Trachonychie) Alkiewiez, J. (Poznan) (1950): *Annales de Dermatologie et de Syphiligraphie*, **10,** 136.

Clinical and histological description of three cases in which nail changes of a type not previously described were discovered. The clinical characteristics are that the nails are rough, opaque, covered with scales of various sizes and the lunules are not visible; there is no inflammation of the periungual tissues; and some nails show koilonychia. The lesions are produced by an inflammatory process in the proximal part of the matrix which produces the superficial layers of the nail. Any irritant capable of producing inflammation might cause this disorder. In two cases chemical agents were involved, potassium hydrate and petrol; but in the third no cause was found.

A CASE OF TURNER'S SYNDROME WITH COARCTATION OF THE AORTA AND A PULMONARY ARTERIO-VENOUS ANEURYSM

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Turner[1] described a syndrome of primary ovarian agenesis, webbed shoulders and cubitus valgus. He recognized that this triad could be associated with other congenital abnormalities and Bishop[2] mentions coarctation of the aorta. The case to be described here had these features with, in addition, an arterio-venous aneurysm of the lung.

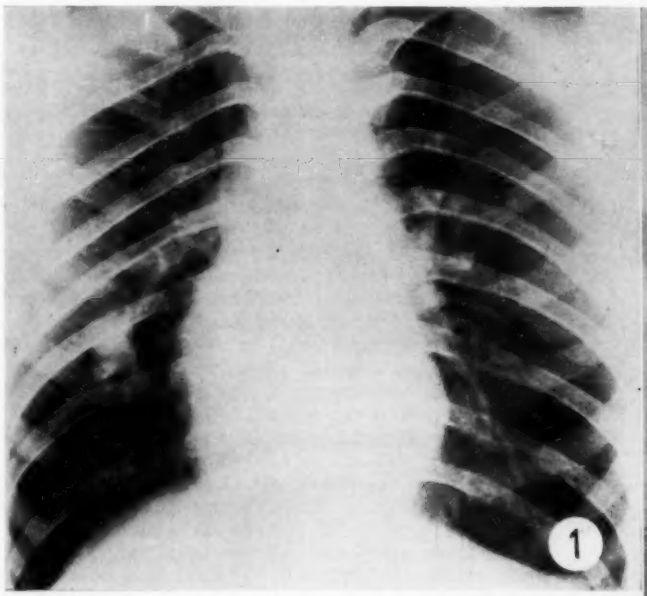
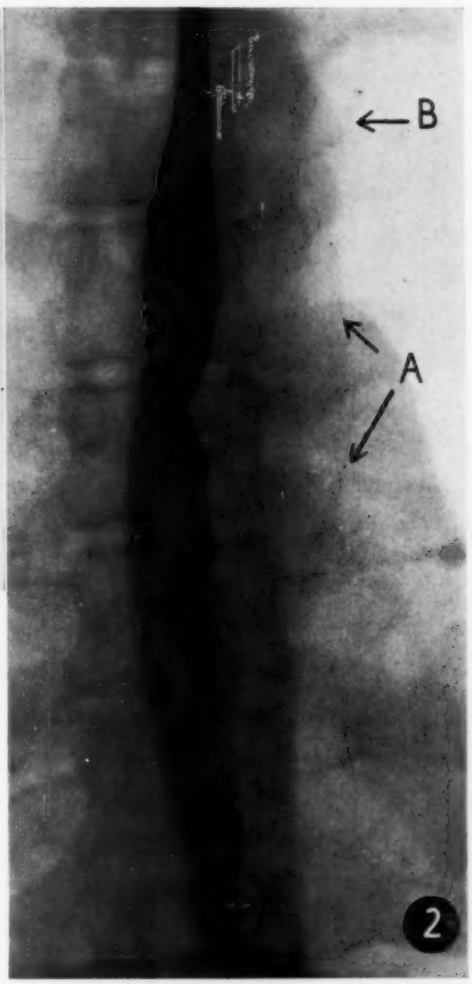


Fig. 1. Postero-anterior view. Note the cardiac displacement and the lobulated opacity in the right lung field.
Fig. 2. Postero-anterior view, showing the small aortic knuckle, the post-stenotic dilatation of the aorta (A) and the prominence of the left subclavian artery (B).

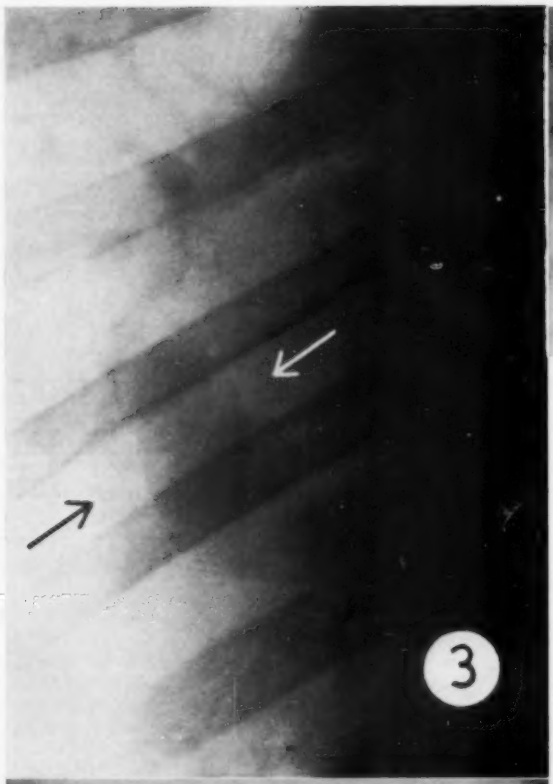
Case Report. A girl of 17 years complained that she had never menstruated. She had always been short in stature, but apart from an operation for webbed shoulders in early childhood, she had always enjoyed good health. Other members of the family were normal.

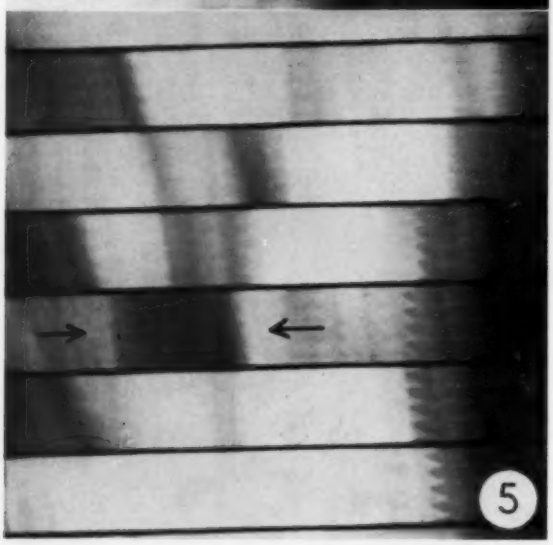
She was 4 feet 5 inches in height and of a slender, immature appearance. There was well marked cubitus valgus. There were scars in both suprascapular regions and slight webbing and elevation of the shoulders. The breasts were undeveloped and there was no axillary or pubic hair. The external genitalia were small, but within normal limits. No rectal or vaginal examination was permitted.

There was no cyanosis or plethora. The blood pressure in the right arm was 160/90 mm. Hg. and in the left arm 154/80 mm. Hg. The lower limb arteries were not palpable and the blood pressure was unobtainable. There were no visible or palpable anastomoses. The examination of the heart was negative.



No abnormality could be detected in the respiratory system. There were no bruits. No abnormality could be detected in the alimentary and central nervous systems.





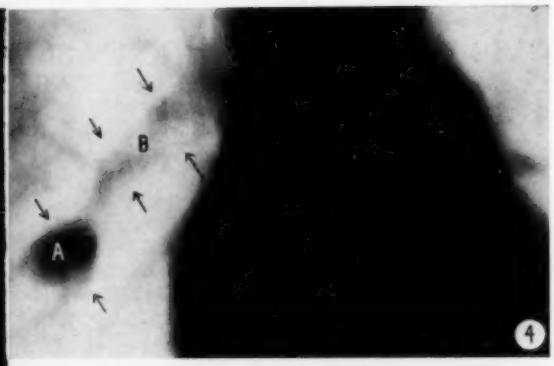


Fig. 3. Left anterior oblique view, showing the lobulated character of the tumour.
Fig. 4. Tomogram. Note the thick leash of vessels (B) connecting the tumour (A) with the abnormally shaped hilum.
Fig. 5. Kymograph. Note the distorted pulsations suggestive of a tumour with inherent pulsation.

Laboratory Investigation. Urine normal. Blood urea 32 mg. per 100 ml. Modified Ide, negative. Full blood count, normal. No hormonal assays were possible as the patient refused to co-operate.

Radiological Investigation. There was slight delay in the fusion of several epiphyses. The skull and the cervical spine were normal. There was marked cubitus valgus.

There was no notching of ribs. There was a minor degree of scoliosis, not sufficient to account for the definite displacement of the heart to the right (Fig. 1). The heart outline was normal and no evidence of any chamber enlargement could be detected on fluoroscopy. No definite aortic knuckle could be seen and there was post-stenotic dilatation of the aorta (Fig. 2). The proximal portion of the left subclavian artery was prominent. On the postero-anterior and lateral views of the oesophagus there was an indentation suggestive of an aberrant vessel but the evidence on this point was inconclusive. There were pleural adhesions in both costo-phrenic sulci. In the right lung field there was a well-defined, lobulated shadow seen best in the left anterior oblique view (Fig. 3), and shown by tomography to be connected to the upper part of the right hilum by a thick leash of vessels (Fig. 4). This shadow showed a change in size with the Valsalva and Muller manœuvres, but this change could not be defined. Pulsation could not be detected on fluoroscopy, but the presence of inherent pulsation could be inferred from the kymograph (Jackson[3]) (Fig. 5). These features indicate the presence of a pulmonary arterio-venous aneurysm. In addition, the right hilum was smaller, showed fewer vessels and its upper border was higher than normal. There was no excessive hilar pulsation.

Conclusion. A case of Turner's syndrome with coarctation of the aorta and a pulmonary arterio-venous aneurysm is reported.

I am indebted to Dr. S. P. Jacobson for permission to publish this case.

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URETERIC CALCULI

THE APPLICATION OF BASIC PRINCIPLES IN THEIR CONSERVATIVE MANAGEMENT

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Few urologists regard the management of ureteric calculi as a test of their judgment, skill or instrumental ability. The immediate colic is partly relieved by opiates and cystoscopy follows. Thereafter the handling becomes stereotyped. The stone is voided spontaneously within a short time. Alternatively the surgeon decides that ' the kidney is screaming for help ' and removes the calculus by operation.

Usual Sites of Stone Impaction. The normal ureter is 27 cm. long and has a mean diameter of 4 mm. There are four areas of normal ureteric narrowing. These are at the ureteric orifice and 5, 12 and 22 cm. above it. Here the diameter is 3 mm. Stones will tend to impact at these levels.

Most stones impact low down the ureter because:

i. The constriction in the lower end of the ureter is longer than the other areas of normal narrowing.

ii. The ureteral curve within the bony pelvis is oblique and so tends to retard the passage, particularly, of the larger calculus.

iii. The intramural ureter is narrow. This narrowness is accentuated by spasm of the bladder wall contracting on the ureter and by oedema of the ureteric mound.

Thus on purely anatomical grounds one may postulate that a stone less than 5 mm. in diameter will be voided spontaneously, and that one of larger calibre will require assistance.

Physiological Mechanism of Stone Extrusion. The basic cause of the presenting symptom is an acute retention of urine within the kidney pelvis. Following impaction of the stone, the pelvis and the ureter above it contract in an attempt to overcome the obstruction. It is this superadded spasm which renders the obstruction complete and thus produces the intense pain.

Pain relief is obviously best afforded by combating the spasm. Once this is done the obstruction becomes incomplete and partial pelvic decompression can occur.

The spontaneous expulsion of an ureteric calculus is primarily achieved as a result of the hydrostatic pressure above it. The higher the stone in the ureter the greater the pressure above it and therefore the more easily propelled. Conversely, the farther a stone descends the more is the hydrostatic pressure expended laterally and the less is it applied directly to the stone. Thus the lower a stone lies in the ureter the less likely is it to be voided spontaneously.

Treatment must be directed primarily to aiding the natural mechanism; and if this mechanism is borne in mind, surgical removal of calculi from the upper ureter must inevitably become the rarest of rare procedures.

Following stone impaction renal secretion stops and the mechanism of tubular reabsorption is intensified. This cessation of function persists as long as the obstruction remains complete.

The kidney is further safeguarded by additional factors:

1. Thirty per cent. of calculi are grooved. Thus once the superadded ureteric spasm abates, egress is afforded for the escape of urine along these channels.

2. Stones impacted in the lower ureter tend to imbed themselves in the wall. A ' blow-out ' mechanism occurs and the stone comes to lie in a ureteric pouch. Thus again room is provided alongcide the stone for the outlet of urine.

3. Ureteric calculi increase in size extremely slowly, if at all.

MANAGEMENT OF CALCULI

The management of ureteric calculi falls naturally into three main subdivisions, and in each basic principles are applied.

Detailed case histories will be outlined in a subsequent communication.

A. *Pain Relief.* The pain is produced by an acute retention of urine within the kidney pelvis. It can never be relieved by opiates or by pethidine even in maximum dosage. Antispasmodics are more effective, and 10 c.c. of 1% procaine intravenously even more so. However, no drug exists which will relieve the pain completely.

The urinary retention must be overcome if the pain is to be relieved. The rational method of so doing is to abolish the superadded spasm.

Immediate and dramatic pain relief is afforded by paravertebral block of the twelfth thoracic and the first and second lumbar ganglia on the affected side. These are each infiltrated with 10 c.c. of 1% procaine. The procedure is an office one. It is safe and technically simple. In a matter of seconds it converts a miserable pain-racked individual into a normal human being. In addition it affords relief of the reflex abdominal distention usually associated with stone impaction. This latter poses a problem in that if the impaction persists, it progresses and may precipitate a paralytic ileus. Conversely, opiates and allied drugs commonly used induce nausea and vomiting and so increase the bowel upset.

B. *Establishment of the Diagnosis.* Here prograde pyelography is unexcelled. In the first place it details the unaffected kidney. It determines the site of the obstruction and the type and also outlines the kidney above.

In the complete obstruction there is no dye secretion from the affected side, but this does not apply where the superadded spasm has been relieved by preliminary paravertebral block. Here the obstruction is incomplete and dye secretion is adequate. Concentration is accentuated because of the partial hold-up, so that visualization is satisfactory in spite of the associated gaseous distention.

C. *Endoscopic Procedures.* Cystoscopy is used to assist the natural mechanism in propelling the stone down the ureter. In addition it is of value in relieving kidney retention and in overcoming acute kidney infection.

Five recognized cystoscopic procedures exist. Most, however, are employed loosely. They are:

i. *The Indwelling Ureteric Catheter.* The catheter is manipulated beyond the stone and guided to the renal pelvis. This decompresses the kidney and produces immediate relief of pain. This persists as long as the catheter remains *in situ*. It is of primary value in the acutely infected kidney in that it short-circuits the obstruction and affords adequate drainage. It is essential that the catheter drainage be maintained in a closed circuit; otherwise further infection is introduced up the lumen.

The inlying ureteric catheter is of no value in assisting stone extrusion. In fact, it decompresses the kidney and so removes the hydrostatic pressure needed to expel the stone.

ii. *Forcible Removal of the Stone.* Numerous ingenious gadgets fashioned in the nature of umbrellas are available. Theoretically they are manoeuvred beyond the stone, opened to engage the stone, then removed with the stone enmeshed in their prongs. Commonly a large strip of ureteric mucous membrane is removed in the process, and the end result is an extensive, often impermeable, ureteric stricture with a 'cure' worse than the original disease.

The stone-basket is a dangerous contrivance. It may easily perforate the ureter, often producing a fatal peri-ureteritis. The prongs may snap while *in situ* and make removal of the instrument a formidable procedure. Haemorrhage following its use is common and may be alarming. In all it is an instrument the use of which can never appeal to the conservative mind.

A stone removed with the aid of a stone-basket would almost certainly have been voided with the aid of safer procedures.

iii. *Ureteric Dilatation.* The ureter is dilated up to and, if possible, beyond the stone. This is the safest procedure and most nearly meets the physiological requirements. It dilates the 'normal' constrictions which bar the descent of the stone and thus decreases the obstruction to the action of the renal hydrostatic pressure.

Ureteric dilatation can safely be repeated at regular intervals until the stone is eventually voided.

iv. *Ureteric Meatotomy.* This is of value in the stone impacted in the intramural ureter. The opening is enlarged sufficiently to allow the stone to enter the bladder. It is not an entirely safe procedure in that it may be followed by haemorrhage of alarming proportions.

v. *Diathermy Fulguration of the Ureteric Mound.* This is used with the stone impacted at the ureteric orifice, when the surrounding bladder mucous membrane becomes oedematous. Commonly this oedema produces sufficient additional obstruction to prevent extrusion of the stone. Light fulguration of this area is usually followed by immediate pain relief and by voiding of the calculus.

The combination of repeated paravertebral blocks and of full ureteric dilatations commonly results eventually in spontaneous voiding of the stone. Few indeed are those that do not eventually pass. Many take 12 or more months to do so, but with patience and intelligent management less than 3% come to surgery.

The indications for operative intervention are thus limited. Briefly they are:

i. A stone that is obviously too large to void. In the border-line case it may be assumed that an oval- or triangular-shaped stone will pass, and that a rectangular- or comma-shaped one will not.

ii. The presence on the involved side of a superimposed acute kidney infection which does not respond to catheter drainage and antibiotics.

iii. Progressive renal back pressure changes with advancing hydronephrosis and diminishing kidney function.

iv. Poor function in the opposite kidney.

SUMMARY

1. The natural mechanism of stone propulsion down a ureter is discussed.

2. Means for aiding this mechanism are described and a plea is made for a more conservative approach in the management of the ureteric calculus.

HEALTH CENTRES

A MEMORANDUM FOR THE INFORMATION OF GOVERNMENT OFFICERS

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Recently the Department of Health issued a memorandum to Magistrates explaining the relationship between Health Centre practice and the medical services rendered to indigents through District Surgeons.

It should be explained that District Surgeons normally receive their instructions from the local magistrate and communicate with the Department through him.

The first paragraph of the memorandum referred to the article, by myself, on *Government Health Centres in the Union of South Africa*, published in this *Journal* on 23 July 1949, as being explanatory of the historical origins and general functions of Health Centres. I then went on to say: Administratively, each Health Centre

* Chief Health Officer for the Union.

is in charge of a whole-time Medical Officer (in one or two instances, a part-time Medical Officer) who is responsible direct to the Head Office of the Department of Health in Pretoria. He has, of course, standing instructions to co-operate with the local representatives of other Departments and with local authorities and voluntary agencies in the carrying out of his own duties.

Particular mention must be made of the relationship between the functions of the district surgeon and those of the Health Centre. In this connection attention is directed to the second (complete) paragraph in the first column of p. 631 of the article from the *South African Medical Journal*, the third paragraph in the second column of p. 631, and the first paragraph on p. 632.

As indicated in the passages to which attention has just been drawn, it is not necessary for members of the general public to obtain an order from the magistrate of the district before going to the Health Centre. The preventive services at a Health Centre—like those given by municipalities—are free to all who wish to avail themselves thereof. Preventive services include the routine examination of and giving of advice in regard to infants, pregnant and nursing women, and indeed the routine examination or 'health check-up' of any person from within the area of the Health Centre's activities (as recognized by the Medical Officer-in-Charge) who desires it and presents himself at the Health Centre for such examination. They include also immunization against smallpox, diphtheria (including diphtheria *cum* whooping-cough) and enteric.

If, at routine or health examination, any person is found to be suffering from ill health requiring curative treatment, the next step depends upon the circumstances in each case. Should the condition be infectious, it is the duty of the medical officer, as it would be of any other medical practitioner, immediately to notify the local authority if the disease is notifiable; and if it is infectious but not notifiable he should still inform the local medical officer of health. The purpose of all this is that the local authority and its medical officer of health may take *such steps as they deem necessary in order to fulfil their statutory duty to safeguard the public health*. It must be stressed that the establishment of a Health Centre in an area does not relieve the local authority of its statutory duties, as set out in section 10 and Chapter III of the Public Health Act No. 36 of 1919 and relevant Amending Acts.

With regard to the treatment of the sick person, should he be suffering from a non-infectious condition or even if suffering from an infectious condition in respect of which the local medical officer of health does not consider it necessary that the patient be accommodated in a place of isolation (Section 25 of the Public Health Act), it is the duty of the medical officer-in-charge of the Health Centre to treat only those persons who cannot afford to meet the cost of the necessary treatment—except only in the case of syphilis, for which treatment has always been provided free by the Government (hitherto through district surgeons and through medical officers of local authorities which have established special clinics in terms of section 66 of the Public Health Act).

It has been assumed that, partly by reason of their location and their obviously public nature, Health Centres will, generally speaking, attract only persons who cannot afford to meet the costs of curative medical treatment from their own resources. However, the medical officers of Health Centres have standing instructions not to give free curative treatment to any person who can afford to pay, but to refer such person to a private practitioner of his (the patient's) choice. *In cases of doubt, they are to consult the local magistrate* or local Native Commissioner or local social welfare officer. Through the very nature of Health Centre practice, the medical officers usually have an accurate idea of the economic and social circumstances of those who come to the Health Centre; although, as indicated in the article by the Chief Health Officer, no more definite criteria have been laid down for them than for magistrates called upon to determine indigency.

Just as the establishment of a Health Centre does not absolve a local authority from its statutory functions, no more does it absolve the district surgeon of the area from carrying out his duties, which in the case of a part-time district surgeon are laid down in his Memorandum of Agreement. The establishment of Health Centres is *not* intended to relieve the district surgeon of his existing duties but to supplement the services, necessarily somewhat limited, which the district surgeon supplies. Thus, except with regard to vaccination against smallpox or unless specially instructed by the magistrate to investigate a suspected outbreak of infectious disease, it is not the duty of the district surgeon to undertake, for all and sundry, the preventive services which are supplied *at* the Health Centre by the medical officers thereof.

It is, however, the duty of the district surgeon to examine any indigent person sent to him by the magistrate (who must first satisfy himself as to the existence of indigency) for examination and treatment, or to whose home he (the district surgeon) is sent by the magistrate. *The district surgeon in an area where a Health Centre has been established has no right whatsoever to refer indigent persons, in need of medical care, to the Health Centre instead of examining and treating them himself. District surgeons who do this are liable to have their basic salaries and drug allowances reduced.*

It will of course happen that indigent persons will go to the Health Centre instead of asking the magistrate for an order upon the district surgeon, and to that extent the district surgeon will be relieved. However, the district surgeon should not endeavour, even by indirect means, to divert indigent patients from himself to the Health Centre; and any such endeavour on his part will be regarded by the Department in the same light as it will regard direct evasion of duties as indicated in the italicised passage in the preceding paragraph.

The Department of Health does not regard it as part of the normal duty of the medical staff of Health Centres to provide medical attention to patients *in their homes*, even when those homes are situated within the area specially served by the Health Centre, except where a district nursing or midwifery service is being provided by a nurse or midwife on the staff of the

Health Centre, in which case the nurse is entitled to call in the medical officer if she considers it necessary to do so.

Should a person living within the area normally served by a Health Centre require domiciliary medical (not merely nursing) attention, he is not entitled as a right to demand the services of the medical officer of the Health Centre, even if that officer has previously (at the Health Centre) treated him for the same or some other illness.

In such case, the sick person should, if he is unable to afford the services of a private practitioner, *apply to the magistrate* for the services of the district surgeon. The latter is not entitled to refuse to attend the sick person (assuming an order is issued by the magistrate) on the ground that a Health Centre doctor is available, or even on the ground that a Health Centre doctor has already examined or treated the patient.

It is, of course, incumbent upon the sick person to explain to the district surgeon (or private practitioner) now attending him that he has already been examined and treated, *as an outpatient*, by a doctor at the Health Centre in the area.

The Department, however, has no objection to an arrangement between the medical officer(s) of the Health Centre and the district surgeon (in respect of indigent patients) or the private practitioner(s) (in respect of patients who cannot obtain a magistrate's order upon the district surgeon) in the area whereby the Health Centre doctor agrees to give domiciliary medical services to any person who has previously been attended by him at the Health Centre and/or to any person resident in the area served by a Health Centre. Medical officers at Health Centres are free to enter into such arrangements *on the basis of mutual agreement between themselves and their medical colleagues in the area.* The honouring of such an agreement is not part of the official duty of the Health Centre doctor but depends entirely upon his sense of professional obligation and courtesy towards those with whom he has made it.

In an emergency, i.e. when the illness is so acute or serious that the patient cannot wait to secure the services of the district surgeon or of a private practitioner, in a person not coming within the purview of an arrangement as outlined in the preceding paragraph, the medical officer of the Health Centre should at once attend in order to render emergency aid. He should then hand over the patient to the district surgeon or a private practitioner as the case may be.

BANTU SYPHILIS

A REPORT ON 184 CASES

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Four hundred and sixty-two Natives were treated for syphilis on Van Dyk Mine over a period of seven years. Of these, the Wassermann or other test was repeated one or more times on 184 (40%). A negative result was obtained in 120 (65%). Records of the first 102 cases have been published (1945, 1947). This article records the results of the entire series of 184, including 82 fresh cases.

There were 19 cases of primary syphilis, 61 secondary, 100 late, and 4 unclassified. Sero-negative results were obtained by treatment in 17 primary (90%), 42 secondary (70%), and 61 late (61%). Not all the patients were suffering from syphilis. Of those treated for secondary and late syphilis, 43 may possibly have been suffering from jaws.

Drugs Employed. Various combinations of acetylarsan, bisantol, mapharside and penicillin were used. Arrangements were made for out-patients to attend for injections at their convenience. One hundred and twenty-four patients were given weekly injections of acetylarsan and bisantol (usually 3 c.c. and 2 c.c. respectively); 18 received a course of mapharside totalling approximately 1.2 gm. spread over 5 or 10 days in hospital, followed in 9 patients by weekly (average 7) injections of 0.08 gm.; 15 received approximately 1.2 gm. of mapharside plus one million units of penicillin in oil and wax in hospital over a period of 10 days, with no after-treatment; 27 received other combinations of these drugs.

Results. The best results were obtained in the small series treated with mapharside; the next best with acetylarsan and bisantol. The results of the 10-day treatment with mapharside plus penicillin were not satisfactory, probably because the amounts of penicillin given were too small. Table I shows the results of treatment with the different drugs employed.

Of those who became sero-negative from treatment with acetylarsan and bisantol, the average number of injections given was 14.5 of acetylarsan and 13 of bisantol. In other words, sero-negativity was produced on an average in these 85 patients by 2.2. gm. of arsenic plus 1.5 gm. of bismuth metal. The average amounts given to those who became negative in the primary stage were 13.2 injections of acetylarsan (2 gm. arsenic) and 8.4 injections of bisantol (0.96 gm. bismuth metal); in the secondary stage by 14.3 injections of acetylarsan (2.1 gm. arsenic) and 12.5 injections of bisantol (1.4 gm. bismuth metal); and in the late stage by 15.0 injections of acetylarsan (2.25 gm. arsenic) and 14.2 injections of bisantol (1.6 gm. bismuth metal). The numbers of injections for individual patients, however, varied enormously. One patient with late syphilis had

received 48 of acetylarsan and 49 of bismuth before his Wassermann reaction became negative. One remained positive after 41 injections of each compound and another after 54 injections of acetylarsan, 55 of bismuth and two of 0.04 gm. of mapharside. Others became sero-negative with very small doses. One with late syphilis became negative after six injections each of acetylarsan and bismuth; two with secondary syphilis after seven of each, and two with primary and two with late syphilis after eight of each. All these early serum reversals occurred in local Natives who almost certainly had syphilis and not yaws.

TABLE I

TO SHOW RESULTS OF TREATMENT WITH DIFFERENT DRUGS EMPLOYED

	Primary		*Secondary*		*Late*		*Unclassified*		*Total*		%	*Grand Totals*
	+	—	+	—	+	—	+	—	+	—	—	
A. & B.	0	11	12	29	25	45	2	0	39	85	60	124
Maph.	0	3	1	5	3	6	0	0	4	14	78	18
M + P	1	2	3	3	3	3	0	0	7	8	53	15
Other	1	1	3	5	8	7	2	0	14	13	48	27
Total	2	17	19	42	39	61	4	0	62	120	65	184

The sign + is used to indicate ++ (strongly positive), + positive) and ± (doubtful).

Better results were obtained in Natives coming to the mine from Northern Rhodesia, Nyasaland and Portuguese territory than in those from the Union of South Africa and Basutoland. Of 53 immigrant Natives treated, 41 (77%) became sero-negative, while of 128 others, only 77 (60%) became sero-negative. This may have been because some of the immigrant Natives were suffering from yaws, or in some instances it may be attributable to the spirochaetes in these Natives being more sensitive to antisyphilitic remedies. It is probable that in South Africa and Basutoland syphilis has been treated more widely than in parts of Africa remote from European civilisation, and this would be expected to produce more resistant strains of spirochaetes.

Complications. Two patients developed complications. One died from post-arsphenamine encephalopathy during a ten-day course of mapharside and penicillin (reported 1948); the other developed bismuth glossitis with albuminuria from which recovery was complete (reported 1944).

Comment. The treatment administered was generally inadequate. Better results would doubtless have been obtained by using spaced injections of mapharside and bismuth, but the practical difficulties in getting mine Natives to attend reguarly at fixed times for intravenous injections would have meant that a far smaller number would have attended for treatment after the healing of any initial lesion, and fewer serum reversals would have been obtained. Attempts to do this were unsuccessful.

Penicillin in oil and beeswax, which was used for 15 patients, is now known to be inferior to procaine penicillin especially when the latter is combined with aluminium monostearate or carboxymethylcellulose (Robinson *et al.*, 1948).

SUMMARY

1. The results of antisyphilitic treatment of 184 Bantu, 53 of whom came from Northern Rhodesia, Nyasaland and Portuguese territories, are recorded.
2. The dosages of the drugs employed are stated.
3. Mention is made of those who developed complications.

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VERENIGINGSNUUS : ASSOCIATION NEWS

QUEENSTOWN DIVISION*

When I was very kindly invited to speak to the Division, I was given free choice of subject, and so I have chosen to speak on the profession of medicine. In an address by Osler to the Canadian Medical Society in 1902, he spoke of four great features of the profession of Medicine—its noble ancestry, its remarkable solidarity, its progressive character, and its singular beneficence. Gomperz in his brilliant work *The Age of Enlightenment,* pays tribute to the physicians of ancient Greece who laid the foundations of modern medicine. It is to the undying glory of the works and teachings of Pythagoras, Hippocrates, Aristotle, Socrates and Plato, among others, that they brought the spirit of criticism to bear on the superstitious views of the phenomena of life, and by quiet, methodical research into the domain of the physician's art, exercised a most beneficial influence on the whole intellectual life of mankind.

'To this critical sense, and sceptical attitude,' Osler tells us, 'we owe first the emancipation of medicine from the shackles of priestcraft, and of caste; secondly the conception of medicine as an art based on accurate observation, and as a science, an integral part of the science of man and nature; thirdly, the high moral ideals, expressed, as Gomperz calls it, in that most memorable of human documents—the Hippocratic oath; and fourthly, the conception and realization of medicine as the profession of a cultured gentleman. No other profession can boast of the same unbroken continuity of methods and of ideals. The profession has never lacked men who have lived up to these Greek ideals.' They were those of Galen in the second century, of Aretaeus, of the men of the Alexandrian and Byzantine school, of the best of the Arabians, of the men of the Renaissance, and they are ours to-day.

A second distinctive feature is the remarkable solidarity of Medicine, and Osler reminds us that 'of no other profession is the word universal applicable in the same sense. It is not the prevalence of disease, or the existence everywhere of special groups of men to treat it, that betoken this solidarity, but it is the identity throughout the civilized world of our ambitions, our methods and our work. To wrest from nature the secrets which have perplexed philosophers in all ages, to track to their sources the causes of disease, to correlate

* Address delivered by Dr. W. Waddell at the Dinner held in Queenstown on 29 April 1950.

the vast stores of knowledge, that they may be quickly available for the prevention and cure of diseases—these are our ambitions. To carefully observe the phenomena of life in all its phases, normal and perverted, to make perfect that most difficult of all arts, the art of observation, to call to aid the science of experimentation, to culivate the reasoning faculty, so as to be able to know the true from the false—these are our methods. To prevent diseases, to relieve suffering and to heal the sick—this is our work. Our profession in truth is a brotherhood, any member of which can take up his calling in any part of the world, and find brethren whose language and methods and whose aims and ways are identical with his own'.

Thirdly, its progressive character: 'Based on science medicine has followed and partaken of its fortunes, so that in the great awakening which has made the nineteenth, and so far the twentieth, memorable among centuries, the profession received a quickening impulse more powerful than at any period in its long history.'

Lastly, the profession of medicine is distinguished from all others by its singular beneficence. Osler says: 'It alone does the work of charity in a God-like way. Search the scriptures of human achievement, and you cannot find any to equal in beneficence the introduction of vaccination, anaesthesia, sanitation with all that it includes, and asepsis.'

I make no apology for these quotations from Osler's address. My reason for introducing them is that I wanted to establish at the outset, the basic qualities of the great art and science to which we have sworn allegiance when taking he Hippocratic Oath, and to which in one or other of its branches, we have consecrated our lives. I could not state these basic qualities half as well as they are set forth in the passages just quoted. And since Osler's day, we have had the discovery of radium, the rapid development of X-ray diagnosis and treatment, the rapid advances in surgery, the elucidation of the sex, pancreatic and other, hormones, the recognition of the vitamins, the advances in therapeutics, the sulphonamides, penicillin, streptomycin and other antibiotics, liver therapy, the introduction of psycho-analysis, the advances in bacteriology—to name only some of the major additions to the progress of medicine, during the past 50 years, in spite of two world wars.

When we pause to consider the basic qualities of the great science and art to which we belong, we cannot but experience a deep sense of gratitude. At the same time the recognition of our responsibilities should cause us to question ourselves as to our qualifications, to serve our profession. The foundation of a sound doctrine of life is a prerequisite to our professional life.

There are three principles which may be regarded as the cornerstone of medical behaviour. We should treat our colleagues as we would wish to be treated, and so exclude the weakness of jealousy, the danger of self flattery, and shame of subterfuge to take hold of ourselves.

In our relations to our patients the interest and advantage of their health should alone influence our conduct towards them. Each should be treated as if he or she were a very close relative. It is as well to remind ourselves that, as Hippocrates taught us, 'Nature heals, the physician is only Nature's assistant'. As the trust of patients in the profession, as guides and advisers is great, so the obligation to be true to their interests is greater, and any signal failure in this respect is wholly discreditable and inexcusable.

In our relation to the State and the laws of the country, there is no better guiding principle than to 'Render unto Caesar the things that be Caesar's'.

We have taken up a life's work, and it should be with a sense of humility, and service, fully realizing that we have taken it up as a life not as a living. More than any other, the practitioner of medicine may illustrate the great lesson that we are here not to get all we can out of life for ourselves, but to try to make the lives of others happier.

The profession of medicine which we have entered guarantees to each of us a happy, contented, and useful life. Its practice will be much as we make it—a worry, an annoyance or a joy. To lay a foundation for that unity and friendship, which is essential to the dignity of the profession, and to demonstrate our solidarity, there would seem to be no better way than to attend our divisional meetings. We should all feel a pride in belonging to our local society. The younger men should be welcomed and encouraged to present cases. To the senior man in our ranks, we look for an example of culture, tolerance and loyalty to the best interests of the noblest of callings. Linked together by the strong bonds of community of interests, we have in our society a powerful stimulus in promoting the good of humanity, and so we cannot be too grateful to the men who have controlled, and who are controlling our parent body. Our clinical meetings can act as a collective study in diffusing valuable knowledge. While conscientious study is directly responsible for all advances in medicine during the past 25 centuries, we are in need of still greater efforts.

Medicine has much to do, and in spite of its achievements greater effort with closer study is needed for the number of victims of the psychoneuroses, of blood pressure, and cardio-vascular disease more than balance some of its successes. Malignant growths, tuberculosis, eclampsia and many other conditions still defy every onslaught.

The unethical acts of greater or lesser degree of which we hear and read at times go to show that it is necessary for us to search our hearts and discover for ourselves whether we are keeping up the qualifications as men, worthy to serve the profession, and whether we are remembering our responsibilities, not to allow the springs of inspiration to fail. Further, are we losing our pride and appreciation of belonging to a heritage made great by men who throughout the ages, have unselfishly sought to do the best in their power for humanity? We are the custodians not only of forms and symbols, which we have inherited, but also the inheritors of traits of an ancient and great profession. A movement to revise our ethical rules is, I understand, engaging the attention of Federal Council, and the result of the deliberation of the World Medical Association at its general meeting has, I am sure, received careful study.

At this meeting the many inadequacies of the Hippocratic Oath as it now stands, were considered, and the need for its revision to meet modern needs and ideas, was stressed. Should the revised oath be found acceptable, would it not be wise to ask each new graduate, white or black, or coloured, to take it in his mother tongue? The revised oath reads:

'Now being admitted to the profession of medicine, I solemnly pledge to consecrate my life to the service of humanity. I will give respect and gratitude to my deserving teachers. I will practise medicine with conscience and dignity. The health and life of my patient will be my first consideration. I will hold in confidence all that my patient confides in me. I will maintain the honour and noble traditions of the medical profession. My colleagues will be as my brothers. I will not permit considerations of race, religion, nationality, party politics, or social standing to intervene between my duty, and my patient. I will maintain the utmost respect for human life from the time of its conception. Even under threat I will not use my knowledge contrary to the laws of humanity. These promises I make freely and upon my honour.'

In our loyalty to one of the noblest of callings, let us labour to fulfil its high mission, bearing our successes with humility, being gentle in our methods, cultured in our behaviour, courageous in our failures and disappointments, and confident that the future holds for us richer blessings than the past.

IN PASSING

There were 5,612 medical practitioners on the Register on 31 December 1949.

REVIEWS OF BOOKS

MONGOLISM

Mongolism (Peristatic Amentia). By M. Engler, M.D. (Pp. 208+vi, with 12 text illustrations and 28 plates. 21s.) John Wright & Sons Ltd. 1949.

Contents: 1. Nomenclature. 2. Historical. 3. Distribution and Frequency. 4. Pathology. 5. Prognosis, Treatment and Training. 6. Aetiology. 7. Postscript. 8. Bibliography.

Mongolism is a degenerative abnormality that has long been of interest to the medical profession and to the specialist in

mental deficiency in particular. The remarkable uniformity in physical and temperamental characteristics exhibited by mongols, wherever they may be born, not only clearly demarcates them from all other types of the degenerative amentias but must also inevitably lead to the assumption that some essentially similar factor is the cause in all cases of mongolism. In the course of the years, since Langdon Down's first clear description of the condition in 1866, there have been numerous articles and monographs on the subject and many theories propounded to account for this unique condition; none is entirely satisfactory and the author of this book presents yet another, viz. 'that mongolian idiocy is a congenital degeneration or malformation produced by the implantation of a normal ovum, which is not affected by any hereditary taint, in a pathological, i.e. diseased, uterine mucosa which is unable to supply the embryo with sufficient nourishment', especially during the early period of foetal life.

The book contains a wealth of descriptive detail covering the physical and mental characteristics of mongolism and which is largely a compilation from the vast literature on the subject. The major interest is, of course, in the question of etiology, and while one cannot altogether accept the author's theory as satisfactorily proven he has made out a good case for it and further work on these lines is obviously indicated.

The specialist in mental deficiency will find this small book an essential addition to his library.

THE RAT

The Rat in Laboratory Investigation. Edited by Edmond J. Farris, Ph.D. and John Q. Griffith, Jr., M.D. (Pp. 542 + xvi. With 179 illustrations. £5 5s.) London: J. B. Lippincott Company. 2nd ed. 1949.

Contents: 1. Breeding of the Rat. 2. General Methods. 3. Gross Anatomy. 4. Experimental Methods and Rat Embryos. 5. Dietary Requirements of the Rat. 6. The Teeth. 7. The Digestive System. 8. Metabolism. 9. The Central Nervous System. 10. Technics for the Investigation of Behavioral Phenomena in the Rat. 11. The Circulatory System. 12. The Use of the Rat in the Biologic Assay of Hormones. 13. Dosage of Drugs for Rats. 14. Hematology of the Rat—Methods and Standards. 15. Radiologic Considerations. 16. Surgery of the Rat. 17. Histologic Methods Adapted for Rat Tissues. 18. The Osseous System. 19. The Eye of the Albino Rat. 20. Protozoan Parasites of the Rat. 21. Metazoan Parasites of the Rat. 22. Spontaneous Diseases of Laboratory Rats.

The second edition of this book, which is an invaluable source of information to experimental physiologists and pathologists, has been revised thoroughly. The new edition is some 50 pages larger than the first edition published in 1942. This is mainly due to the extensive revision of Chapter 12 on *Dosage of Drugs for Rats.* A large number of substances developed during and after the war has been included.

Although this book is primarily a guide for the research worker, it contains material of general interest to the physiologist, biochemist and pathologist.

RECENT ADVANCES IN PHYSIOLOGY

Recent Advances in Physiology. By W. H. Newton, M.D., M.Sc. (Manch.), D.Sc. (Lond.). (Pp. 268. With 90 figures and 30 tables. 21s.) London: J. and A. Churchill Limited. 7th ed. 1949.

Contents: 1. The Physical Basis of Temperature Regulations. 2. Water Diuresis. 3. Digestion. 4. Some Aspects of the Physiology of Pregnancy. 5. Blood Pressure and the Kidneys. 6. Catheterisation of the Heart. 7. The Electrical Excitation of Nerve. 8. Cutaneous Sensation. 9. Auditory Impulses. 10. Colour Vision.

The latest edition of this book is especially welcome as the previous edition was published in 1939. The chapters are all new and show that, in spite of the temporary set-back during the war, some exciting things have been happening in the world of physiology. Although the book has been written primarily for physiologists, it will repay study by the non-professional physiologist. Several chapters 'are of special interest to the clinician. Chapter III includes an excellent summary of Wolf and Wolff's monograph on *Human Gastric Function.* A short account is also given of the recently discovered hormone pancreozymin, which is produced by the upper intestine and controls the enzyme content of pancreatic juice. In Chapter V the humoral mechanisms of hypertension are analysed and Trueta and his colleague's important contribution to the physiology of the renal circulation is described and its bearing on the problems of hypertension discussed.

Chapter VI deals with work on the catheterization of the heart—the determination of cardiac output in man. McMichael's new conception of the action of digitalis and the application of the method to the study of congenital cardiac defects.

The book is extremely well written. Each chapter is a model of what a physiological review should be, a dynamic piece of writing full of interest and stimulating discussion.

REHABILITATION

Rehabilitation, Re-education and Remedial Exercises. By Olive F. Guthrie-Smith, M.B.E., F.C.S.P. (Hon.), T.M.G. With a Foreword by Lord Horder, G.C.V.O., M.D., F.R.C.P. (Pp. 456 + xii, with 283 figures. 25s.) London: Baillière, Tindall and Cox. 2nd ed.

Contents: 1. Introductory. 2. Some Revision of Kinesiology, Anatomical and Physiological Matter underlying Physical Treatment. 3. Apparatus for Re-education and Rehabilitation. 4. Principles of Suspension Exercises. 5. Suspension Therapy in the Treatment of Flaccid Paralysis. 6. Suspension Therapy for Relaxation and in the Treatment of Spastic Paralysis. 7. Suspension Therapy for Correction and Manipulation. 8. Joint Manipulation. 9. Pulley Therapy. 10. The Use of Helical Springs for Assistance and Resistance in Remedial Treatment. 11. Rehabilitation in the Department. 12. Rehabilitation in the Wards. 13. Recovery after Fractured Femur. 14. Rehabilitation in the Fracture Clinic. 15. Rehabilitation in the Chest Unit. 16. Rehabilitation in the Maternity Unit. 17. Rehabilitation by Games. 18. Rehabilitation in the Gymnasium. 19. Electricity in Rehabilitation. 20. The Value of Massage in Connexion with Skin Graft and Similar Operations. 21. Massage and Rehabilitation. 22. Occupational Therapy and Rehabilitation.

Rehabilitation is the watch-word of Medicine to-day and any handbook dealing with the subject excites interest.

Mrs. Olive Guthrie-Smith is well known for her contributions to this subject. She has, over a period of many years, evolved and finally laid down the principles governing sling suspension. This form of therapy is utilized widely in all Departments of Physical Medicine in the British Hospitals, and it is to be regretted that our own Departments are so ill equipped with this most universally valuable form of apparatus. By means of sling suspension an accurate estimate of muscle function can be assessed with the elimination of trick movements. As a means of therapy, the sling suspension apparatus permits gravity-free and controlled movement of disabled muscle groups. It enjoys a valuable advantage over deep pool therapy, in that it is less expensive, is mobile, and unwanted movements, so common in cases of anterior poliomyelitis, can be easily recognized and eliminated.

The chapter on electricity in rehabilitation is as optimistic as it is confusing. Current modalities, antique and otherwise, are recommended with sparse explanation of their physiological actions and it is depressing still to read of sciatica considered as a disease entity and not as a symptom.

The appendices which have been added to the second edition are well conceived and will be found valuable to the physiotherapist.

Ludwig Guttmann's all too brief account of the treatment of injuries of the spinal cord and cauda equina, gives a clear and encouraging picture of the value of rehabilitation in these conditions. His Paraplegic Unit at Stoke Mandeville shows co-ordinated group medicine at its best.

This is a valuable book and one that can be used with profit both by medical men interested in rehabilitation and by physiotherapists on whom the practical weight of rehabilitation falls.

The text is plentifully illustrated by clear and instructive diagrams and photographs.

MEDICINE FOR NURSES

A Textbook of Medicine for Nurses. By E. Noble Chamberlain, M.D., M.Sc., F.R.C.P. (Pp. 491 + xiv. With 65 illustrations. 30s.) Oxford University Press, P.O. Box 1141, Cape Town. 5th ed. 1949.

Contents: 1. General Introduction. 2. Bacteriology. 3. Infections. 4. The Venereal Diseases. 5. Nutritional and Metabolic Disorders. 6. Diseases of the Mouth, Salivary Glands, Pharynx, Tonsils and Oesophagus. 7. Diseases of the Stomach and Intestines. 8. Diseases of the Biliary System. 9. Diseases of the Pancreas and of the Peritoneum. 10. Diseases of the Respiratory System. 11. Diseases of the Urinary Organs. 12. Diseases of the Blood. 13. Diseases of the Heart and Blood-vessels. 14. Diseases of the Ductless Glands. 15. Diseases of the Nervous System. 16. Diseases of the Nervous System (Contd.). 17. Diseases of Muscles, Bones and Joints. 18. Principles of Dietetics. 19. Therapeutics. 20. Poisoning.

Dr. Noble Chamberlain's book has been a standard work for student nurses since 1931. The previous edition was published during the war years and the recent advances in medicine, both during the later war years and since, have led to the need for this fifth edition.

Those who are familiar with this work will find that some sections have been re-written and that great revision will be seen, particularly in the chapter on therapeutics, incorporating the use of penicillin and the sulphonamides.

The various advances in radiotherapy are mentioned, as also the many new synthetic drugs. Much revision will also be found in the chapters on venereal diseases and diseases of the ductless glands.

A new section on the neuroses has been included; also a number of valuable diet sheets. Much useful information to nurses is included in an appendix. Summaries at the end of the book give the main features of the various commoner diseases met in practice.

This textbook has always been of value to student nurses and the new edition is welcomed.

CORRESPONDENCE

INOCULATION AND POLIOMYELITIS

To the Editor: Recently we have had considerable correspondence in both the lay and the medical press, about the incidence of poliomyelitis after diphtheria and whooping cough inoculation. Many years ago, I can recollect something similar, with regard to smallpox vaccination—both virus infections.

To my mind, one point has so far been missed, viz. the possibility of the infection being carried by our scarifiers, needles and syringes.

It is now generally accepted that what we first used to call arsenical poisoning (jaundice with hepatitis), is really a virus infection, introduced by our needles and syringes, at the time of the intravenous injection. Is there any reason to believe that such a virus infection cannot be introduced by a simple hypodermic injection, made with a contaminated syringe?

During my 33 years of private practice, I invariably carried a hypodermic syringe in a spirit container—and most G.P.'s do—and felt quite justified in using it repeatedly, without boiling. We now know that viruses are most resistant to spirit and the usual disinfectants, and may remain active for a very considerable time in these media.

Is it not possible that the 68 cases mentioned by one investigator in England, following diphtheria and whooping cough inoculation, could have been infected by needle and syringe taken from spirit? I am not acquainted with the technique at municipal and other clinics, i.e. whether syringe and needle are boiled after each injection, but judging from my own practice at mass injections in the army, and mass inoculations as District Surgeon, I should say, no.

Personally I would say that sterilization by boiling should certainly be carried out during times of virus epidemics.

The theory that trauma in itself predisposes to a universally present infection, or to a more virulent type of infection, is very ingenious, but by no means convincing.

During the last poliomyelitis epidemic, we must have performed many thousands of operations at the Pretoria Hospital, and must have given hundreds of thousands of injections, and must presume that many hundreds of our cases were susceptible to the virus, especially in the children's wards, yet we did not have any cases after such trauma. Is it not possible that the reason for this is to be found in the fact that in hospital, our instruments, syringes and needles are invariably sterilized by boiling, whereas outside, we depend too much on spirit and other disinfectants?

280, Berg Street, C. H. H. Coetzee.
Muckleneuk,
Pretoria.
29 April 1950.

AN UNDESCRIBED FEVER

To the Editor: I read with interest in a recent issue of your *Journal* an article on *An Undescribed Fever Resembling Varicella and Rickettsialpox* by Dr. L. J. A. Loewenthal. I thought it would be of interest to your readers to mention a group of cases of a similar nature that came under observation during the War.

For a period of about three years (1942-1945) a series of approximately 200 cases was encountered at various military camps in the Union, particularly at the S.A.A.F. Camp at Germiston; Hector Norris Park, Johannesburg; Baragwanath and the Potchefstroom Military camp.

The course of the fever and the clinical features of this series of cases, were as those described in the above-mentioned article.

The cases occurred in epidemics during the summer months. Very few cases indeed were observed during the cold winter period.

Many of the above-mentioned camps had long veld grass growing in profusion in their vicinity. It was thought, in the first instance, that the condition was a rickettsial-type of fever (tick-bite fever type) due to an initial infection by wood ticks in the grass.

This theory seemed to be borne out by two cases which were of considerable interest. Two S.A.A.F. airmen were compelled to make a forced landing in Northern Rhodesia, north of the Zambesi, and slept the night in the veld. On their return to the S.A.A.F. Camp at Germiston, some days later, both men were found to be suffering from this rickettsial-type of fever with the typical eruption, profuse in both cases.

Mosquitoes, insects and wood ticks found in the camps and in their vicinity were examined by the South African Institute for Medical Research, with negative results.

The complement-fixation test against antigens of the common rickettsial strains, performed in the patients under observation, was negative.

The course of the disease, the generalized adenopathy, and the clinical appearances of the eruption in these cases, were similar to those seen in tick-bite fever, and would tend to suggest that this condition may be due to a yet undetermined rickettsial strain.

Ivor Gluckman.

174, Lister Buildings,
Jeppe Street,
Johannesburg.
3 May 1950.

MEDICAL ETIQUETTE ON THE TELEPHONE

To the Editor: The point raised in the letter under the above heading should in my opinion not be confined to the word 'medical' but only to 'etiquette'. I feel that it is but common courtesy to ring personally and not to keep the called waiting. There are of course exceptions, but it should not be the rule. There can be no differentiation in this instance between a general practitioner and a specialist. Etiquette, just as ethics, must remain the same for both at all times.

I fully agree with the writer that, if I am called and can do so, I take up the receiver.

Nathan Finn.

76, Harrow Road,
Yeoville,
Johannesburg.
4 May 1950.